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Contagious likes and dislikes

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CONTAGIOUS LIKES AND DISLIKES

by

Jayati Sinha

An Abstract

Of a thesis submitted in partial fulfillment
of the requirements for the Doctor of
Philosophy degree in Business Administration
in the Graduate College of
The University of Iowa

May 2011

Thesis Supervisor: Associate Professor Dhananjay Nayakankuppam

ABSTRACT

We demonstrate social contagion in attitudes and show it is more pervasive than believed. While prior research has demonstrated that individuals are influenced by others when explicitly exposed to others' attitudes, we demonstrate they are influenced even for issues where they were never explicitly exposed to group attitudes. In first two studies we show that individuals have a remarkable ability to predict the attitudes of others in a social group from very scant information—a phenomenon that we term *'Social Clairvoyance.'* Across three other studies, we delineate the psychological mechanisms that permit the performance of this feat – specifically, empathic responding directed at group members in an effort to understand their underlying motivations. Further, the empathetic simulation of others attitudes results in reaction in oneself towards the attitude object resulting in a shift in one's own attitudes. In three other studies, we show that the accurate prediction of others' attitudes results in a shifting of an individual's own attitude—a phenomenon we term *'Attitudinal Contagion.'* From this perspective, many marketing phenomena such as word-of-mouth, diffusion of new products, neighborhood effects may have been insufficiently understood since it does not require explicit exposure to the attitudes of another.

Abstract Approved: _____

                                      Thesis Supervisor

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Iowa City, Iowa

CERTIFICATE OF APPROVAL

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PH.D. THESIS

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This is to certify that the Ph.D. thesis of

Jayati Sinha

has been approved by the Examining Committee
for the thesis requirement for the Doctor of Philosophy
degree in Business Administration at the May 2011 graduation.

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To Kush and Neil.

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ABSTRACT

We demonstrate social contagion in attitudes and show it is more pervasive than believed. While prior research has demonstrated that individuals are influenced by others when explicitly exposed to others' attitudes, we demonstrate they are influenced even for issues where they were never explicitly exposed to group attitudes. In first two studies we show that individuals have a remarkable ability to predict the attitudes of others in a social group from very scant information—a phenomenon that we term *'Social Clairvoyance.'* Across three other studies, we delineate the psychological mechanisms that permit the performance of this feat – specifically, empathic responding directed at group members in an effort to understand their underlying motivations. Further, the empathetic simulation of others attitudes results in reaction in oneself towards the attitude object resulting in a shift in one's own attitudes. In three other studies, we show that the accurate prediction of others' attitudes results in a shifting of an individual's own attitude—a phenomenon we term *'Attitudinal Contagion.'* From this perspective, many marketing phenomena such as word-of-mouth, diffusion of new products, neighborhood effects may have been insufficiently understood since it does not require explicit exposure to the attitudes of another.

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INTRODUCTION

When people are free to do as they please, they usually imitate one another. --

Eric Hoffer

Each year marketers spend millions of dollars in an attempt to influence the opinions of consumers. This process is not easy because individuals do not form or maintain their opinion in isolation—they do so within a rich social context in which individuals are embedded (Granovetter 1985). This affects consumption decisions, as people observe others and are aware of being observed by others. For instance, consumer influence over other consumers has been demonstrated in scholarly research concerning word-of-mouth, social and communication networks, opinion leadership, and diffusion of innovations (Argo and Main 2008; Bearden and Etzel 1982).

As Hoffer suggests, individuals are influenced, to greater or lesser degrees, by others (Denrell 2008). Such a notion is suggested by even the earliest theories of social influence. For instance, Kelman (1961) identifies three types of social conformity – compliance, identification and internalization. Ample evidence such as group polarization aka risky shift (Moscovici and Zavalloni 1969), social conformity (Sherif 1936; Asch 1952), and the chameleon effect (Chartrand and Bargh 1999) suggest that individuals are influenced by others' opinions and these influences are, at least under some conditions, beyond volitional control.

But the extant evidence applies when one is explicitly exposed, actively or passively, to another's behavior/judgments. What of situations where this is not the case – where one never observes another's specific attitudes? We suggest social influence can be observed even then. That is, individuals are influenced even for issues where they

were never explicitly exposed to group attitudes. Why? We propose that individuals are very good at inferring the preferences of close others, even when no information about these attitudes or preferences is directly voiced. This is because individuals have a remarkable ability to predict the attitudes of others in a social group from very scant information—a phenomenon that we term '*Social Clairvoyance*.' Thus, exposure to a person allows one to make reasonably good inferences about the attitudes s/he might hold, and further such insight is automatically used in constructing one's own attitude—a phenomenon that we term '*Attitudinal Contagion*.'

CHAPTER 1

LITERATURE REVIEW

<u>Can lay judges be accurate?</u>

A consumer of the decision-making literature might be excused for concluding

that humans are appalling judges, given the host of biases and errors that have been

documented. However, recent work in social psychology has revealed that humans can be

remarkably accurate under certain conditions. For instance, research in person perception

has recognized that individuals are not only able to make accurate judgments about

others, but that accurate judgments can be made even without any exchange of

information (Albright, Kenny and Malloy 1988). Recent work on shared reality has

suggested that individuals have a basic need to feel commonality (shared reality) with

others which can be experienced by successfully connecting to other people's inner states

(Echterhoff, Higgins and Levine 2009). Moreover, studies over the last two decades have

revealed that impressions based on very brief observations are predictive of certain

personality traits (Funder 1987; Kenny and Albright 1987; Kenny, Albright, Malloy and

Kashy 1994). The idea of human ability to make accurate predictions has received more

startling evidence recently from a phenomenon referred to 'thin-slicing' (Ambady and

Rosenthal 1993; Ambady, Hallahan and Conner 1999) and popularized by Malcolm

Gladwell's bestseller, "Blink!" Ambady, Bernieri and Richeson (2000) phrase the basic

idea – that cues from non-verbal expressions, "can reveal aspects of affect and emotions,

personality, and behavioral intentions" (p.232). In examining the predictive power of thin

slices, Ambady and Rosenthal (1993) show that the ratings of teachers' personality

characteristics by complete strangers based on very thin slices (2-sec to 10-sec video

clips) can accurately predict teachers' end-of-semester ratings by students and principals. Furthermore, judgments based on 30-sec exposures were not significantly more accurate than judgments based on 6-sec exposures. As Ambady and Rosenthal (1993) state, "our results highlighted the invaluable information provided by nonverbal cues in making judgments about others" (p. 439).

<u>Why Might This Be Applicable To Likes And Dislikes?</u>

First, consider that evaluation is a fundamental and vital information processing task (Bechara et al. 1997; LeDoux 1996; Zajonc 1980). Early research (Osgood, Suci and Tannenbaum 1957) shows that much variance in responses to stimuli was accounted for by an evaluative component, underscoring the importance placed by human information processing on evaluative content.

Second, the evidence supporting the 'cultural intelligence hypothesis' suggests that much of the human information processing apparatus appears to have evolved to deal with groups and social relationships (Dunbar and Shultz 2007; Silk 2007; Herrman et al. 2007). Making inferences about others is probably a very primitive process since there are likely strong evolutionary benefits to social animals by making accurate judgments about the likes and dislikes of others in the social group. The hypothesis about a social brain suggests that individuals who are living in stable social groups (comparing to individuals living alone) face cognitive demands which require them to meet their own requirements, as well as coordinate their behavior with other individuals in the group to maintain group cohesion (Dunbar and Shultz 2007). The capacity to develop complex social relationships may be an important benefit derived from having a "social brain"

(Silk 2007). As portrayed by Herrman and colleagues (2007) "humans are not just social but 'ultra-social'" (p. 1360).

Third, the recent discovery of 'mirror neurons', neurons that fire both when one performs an action and sees the action being performed by others, and evidence for the human mirror neuron system (Iacoboni et al. 1999) has led to speculation about such mechanisms being the basis of empathy (Gazzola and Keysers 2006; Jabbi, Swarta and Keysers 2007) and understanding the motivations of others (Fogassi et al. 2005). In other words, the mirror neuron system would appear to be a set of modules to monitor others in the social group and to mirror experiences of evaluations and emotions – that is, for a theory of mind (Gallese and Goldman 1998; Keysers and Gazzola 2007).

Fourth, it has also been argued that humans have the rather unique ability of prospection or simulating future scenarios (Gilbert and Wilson 2007; Ramnani and Miall 2003). When faced with decisions about future events, the cortex generates simulations, briefly tricking sub cortical systems into believing that those events are unfolding in the present and then taking note of the feelings these systems produce" (Gilbert and Wilson 2007). For instance, Ramnani and Miall (2003) report that neural processing involved in preparing one's own actions are also involved in predicting the future actions of others. In other words, individuals possess the ability to "pre-experience" the future by simulating it in minds - it appears reasonable to surmise that they might also have the ability to simulate other individuals' attitudes.

Taking all of this into consideration, it seems probable that individuals would develop a facility for monitoring and making accurate guesses about the likes and dislikes of others in the immediate group. Theoretical models of empathy suggest that it has both

cognitive and emotional aspects (Davis 1983; Duan and Hill 1996). Cognitive empathy refers to one's ability to intellectually assume the perspective of another individual, whereas the emotional empathy refers to one's ability to respond to another person's emotions with the same emotion (Day and Chambers 1991). Since much of attitude research emphasized the importance of affective or emotion components, and empathy may directly address the central feeling and evaluation components of the attitude, it seems likely that empathetic responses could be associated with emotional components of others attitudes. In other words, we propose that adopting the perspective of others in immediate social group leads to increased empathic feelings for others and these empathic feelings about others emotions and feelings could generalize to inferring the overall attitudes of other group members. There is research that, while not testing this specific aspect, is congenial with such a speculation. Research on 'social tuning' (Sinclair et al. 2005; Lun et al. 2007) in the areas of stereotyping and prejudice, in fact suggests that individuals do bias their own attitudes in response to those endorsed by other members of a group. We suggest that such 'social tuning' influences can also occur without explicit endorsing of a position by other group members because individuals can infer others' positions from scant information. We further suggest two possible conditions for 'social clairvoyance:' social interaction and empathetic responding. In summary, our first hypothesis is that individuals possess an ability to accurately predict attitudes of others in a social group or setting.

<u>Will Knowing Others Preferences Bias One's Own?</u>

We live in a social world, which necessitates interacting with a wide variety of people on a regular basis. Although sometimes we know what other people are thinking

and feeling because they have just told us; for the most part we have to construct a mental model of the person to know what's going on inside their heads. By putting ourselves in the 'mental shoes' of another and simulating his or her experience in our own mind, we can intuitively understand what that experience might be like (Gordon 1986). Recent neuro-imaging studies suggest that when we recognize an emotion in someone else, our brains generate the same emotion. The discovery of mirror neurons, neurons that are commonly activated both when an individual observes the behavior of another person and when one performs the same behavior, has led to speculation about such mechanisms being the basis of empathy (Gazzola and Keysers 2006; Jabbi, Swarta and Keysers 2007). For example, observing someone else in pain activates the observer's own representations of the painful experience, thus, the observer directly feels what the experiencer is feeling and this triggers an empathic response.

Empathy denotes, at a phenomenological level of description, a sense of similarity between the feelings one experiences and those expressed by others. At a basic level of description, empathy can be conceived of as an interaction between any two individuals, with one experiencing and sharing the feeling of the other. Does this sharing of the feelings of another person imply that one will act or even feel impelled to act in a supportive way? Some recent research shows that in some domains individuals come to act more like the target. Research on perspective taking, the cognitive or intellectual component of empathy (Yum and Schenck-Hamlin 2005), has shown that perspective takers see more of the others in themselves and often come to act more like the target. For instance, Galinsky, Ku and Wang (2005) tested whether perspective taking leads to an increase in stereotype consistent behavior. They found that taking the perspective (both

perspective-taking self and perspective-taking other conditions) of a stereotypically analytical individual improved analytical reasoning ability. Becoming smarter after taking the perspective of a professor should facilitate interaction with such a person, allowing the perspective-taker to be good in conversation. Other studies show that considering others' perspectives, for instance, increases the likelihood of helping another person in need (Batson, Turk, Shaw and Klein 1994), reduces the use of stereotypes when forming impressions (Galinsky and Moskowitz 2000), increases negotiation effectiveness (Neale and Bazerman 1983), and diminishes a variety of problematic egocentric biases in judgment (Savitsky, Van Boven, Epley and Wight 2005).

Over the last decade, an impressive number of findings from both psychophysics and cognitive neuroscience approaches strongly support a direct connection between the neural and cognitive systems involved in producing one's own action and the systems involved in perceiving the actions of others. This direct link between perception and action has several consequences (and adaptive values), including social mimicry, stereotypes activation that may influence the subsequent behavior of the perceiver (e.g., Chartrand, Maddux and Lakin 2005). For example, perceiving observable aspects of others (e.g., their expressions, postures, behaviors etc.) activates behavioral representations as well as spontaneous trait inferences (Uleman, Newman and Moskowitz 1996) and the immediate activation of stereotypes (e.g., Devine, 1989). This in turn can lead to behavior in line with the activated trait constructs (Bargh, Chen and Burrows 1996; Epley and Gilovich 1999) or stereotypes (Bargh et al., 1996; Dijksterhuis, Bargh and Miedema 2000).

One interesting aspect of sharing the feelings of another person is acting more like the target person–i.e., behavioral contagion. Indeed, prior research has demonstrated the existence of emotional contagion, which refers to the fact that the emotion of the receiver converges with the emotion of the sender (Gump and Kulik 1997; Wrightsman 1960). In the consumption domain, Howard and Gengler (2001) examine the emotional contagion effects on product attitudes. They found that emotional contagion can have a positive bias on product relevant attitudes of consumers. When senders were happy and receivers liked the senders, receiver emotions converged with the happy emotion of senders, and a positive attitudinal bias occurred. Given that, many of our decisions and experiences are often formed by interacting with one another, it seems probable that there is significant potential to extend contagion effects within and across many domains such as attitudes.

How does this translate into attitudinal contagion? Attitudes are evaluative statement favorable or unfavorable related to person, object or event. They reflect how one feels about something. For example if someone says that s/he likes Panasonic microwave, that statement expresses his/her attitude towards the microwave. As mentioned before, empathetic processing leads one to experience the reactions and feeling of others in their immediate social group, as though one were experiencing it oneself. Since, one is able to put one's own emotional/affective responses on hold while simulating another's emotions/reactions as one's own, one's own emotions or reactions are likely to be biased by the presence of others reactions/affections. This could further leads to contagion of one's own attitude because attitudes consist of evaluative and affective responses (e.g. liking for an object).

In sum, our second hypothesis is that, by accurately predicting other's attitude by empathetically simulating their mind makes one experience feelings and reactions of others which in turn will color/bias one's own attitudes.

<p style="text-align:center;"><u>Conceptual Model</u></p>

Based on the findings from prior literatures described in previous section, we develop our conceptual model (figure 1.1). In this research we specifically propose that individuals can infer the preferences of others in a social group, even when no information about these attitudes or preferences is directly voiced. This is because individuals have a remarkable ability to infer the attitudes of others in a social group from very scant information—a phenomenon that we term '**Social Clairvoyance.**' In other words, in a randomly formed social group, individuals are accurate at judging the likes and dislikes of others, even when never explicitly exposed to others' attitudes toward specific targets. Thus, exposure to a person allows one to make reasonably good inferences about the attitudes s/he might hold and this results from the ability to simulate others' minds – that is, empathic responding.

Empathy might enable us to make more accurate predictions of other people's needs and actions and discover salient aspects of our environment. What does it mean to take another person's perspective? If we put ourselves in someone else's place, do we really feel what she feels? Does having a more accurate perception of another person's state of mind make us more sympathetic to his/her plight? Since one is able to put one's own emotional responses on hold while simulating another's emotions/reactions as their own, one's own personal emotions or reactions are likely to be biased by that. In other words, during social interaction an individual infers other's attitudinal reactions based on

the ability to simulate others' minds. The presence of other's attitudinal reactions via simulation in one's mind would results in biasing of one's own attitude, when one is asked to report his/her own attitude towards a specific target object. Specifically, we suggest that the empathetic simulation of others attitudes results in a shift in one's own attitudes. Thus, exposure to a person allows one to make reasonably good inferences about the attitudes s/he might hold, and such insight is automatically used in constructing one's own attitude—a phenomenon that we term '**Attitudinal Contagion**.' Moreover, this process further suggests that attitudinal contagion is mediated through social clairvoyance.

<p align="center">Definitions and Measures</p>

Attitudes are generally positive or negative views of a person, place, thing, or event— this is often referred to as the attitude object (Fazio 1986). Attitude influences an individual's choice of action, and responses to challenges, incentives, and rewards (together called stimuli). Attitude was measured using three semantic differential items, each using a 9-point scale (-4 to +4): good-bad, negative-positive, and unfavorable-favorable.

Attitude strength is defined as a latent psychological construct that is presumably represented in memory by various attributes of the attitude (Krosnick and Petty 1995). Attitude strength incorporates characteristics such as the intensity of one's feelings about the attitude object, the degree to which one is confident that one's attitude toward the attitude object or issue is correct, and the extent to which an individual cares deeply about the issue (Krosnick 1988). Attitude strength has been generally but not exclusively measured by (1) Attitude Intensity (the strength of the emotional reaction evoked by an

attitude object), (2) Attitude Certainty (the extent to which an individual is certain that his or her attitude toward an object is correct, (3) Attitude Importance (the degree to which an individual cares deeply about and is personally invested in an attitude), (4) Interest in Relevant Information (the extent to which an individual is motivated to gather information about an attitude object), and 5) attitude accessibility.

Empathy broadly refers to being able to understand what others feel, be it an emotion or a sensory state (Levenson and Ruef 1992). Accordingly, empathic experience enables us to understand what it feels like when someone else experiences sadness or happiness, and also pain, touch, or tickling. When experiencing empathy, one is able to understand someone else's internal experiences. Previous research has taken two main approaches to the study of empathy (Davis 1983). The first approach focuses on cognitive empathy, or the capacity to take the perspective of another person and to infer their mental states. The second approach emphasizes emotional or affective empathy, defined as an observer's emotional response to another person's emotional state.

<u>Overview of Experiments</u>

We report empirical evidence in support of our propositions. Specifically, (1) that strangers placed in a social situation are surprisingly accurate at judging the likes and dislikes of others in their group, even when never explicitly exposed to others' attitudes toward specific targets (studies 1a, 1b and 1c), (2) that these results are moderated by the level of empathic responding (studies 2a and 2b), and that the accurate prediction of others' attitudes results in a shifting of an individual's own attitude (study 3a). Additionally, we provide better support for the *attitudinal contagion* effect by showing that *social clairvoyance* mediates *attitudinal contagion* (study 3b). Furthermore, we show

that, as predicted by the theory, *attitudinal contagion* occurs only for malleable attitudes,
even though *social clairvoyance* happens for all attitudes (study 3c). In other words,
when the target object is important to us personally, we correct for the contagion.
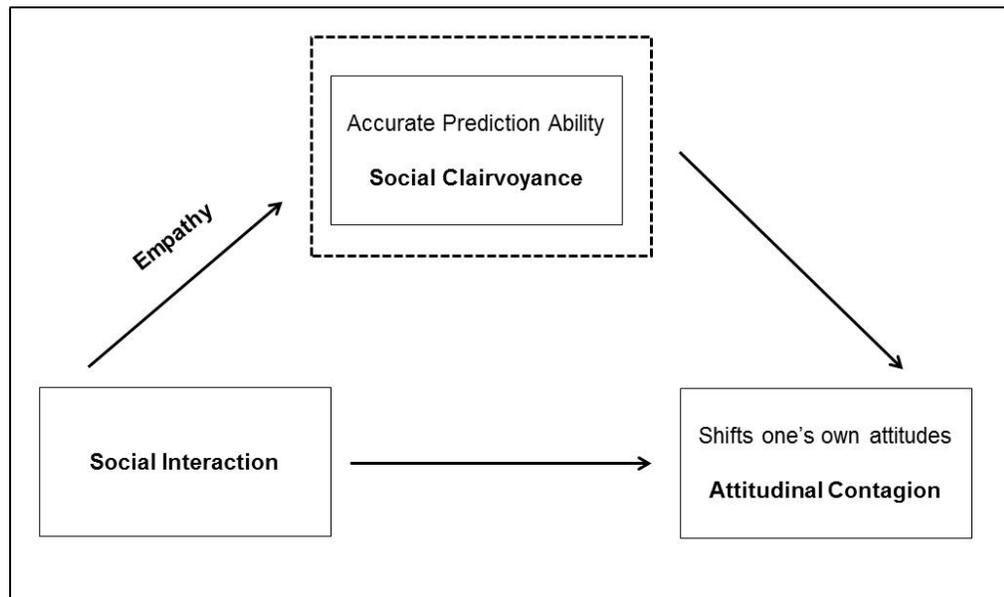
Figure 1.1: Conceptual Model

CHAPTER 2

SOCIAL CLAIRVOYANCE

<u>Study 1a: "I Know What You Like"</u>

We have suggested that individuals possess an ability to make shrewd, accurate

guesses about attitudes of group members even when the specific attitude object is not

discussed. We define attitude as a hypothetical construct that represents an individual's

degree of like or dislike for something. A straightforward test is to ask participants to

predict the attitudes of other group members, and compare those predictions with self-

reports of the others' attitudes. Two groups are utilized, one which is allowed to

experience social interaction first and the second which is not – this allows us to examine

the first hypothesis – whether social interaction allows for accurate prediction of

attitudes. Two standards of comparison appear important. The first is a comparison of

individuals in the two groups to see whether those in the groups that experience social

interaction are more accurate than the groups that do not (i.e., does exposure to any

information about another make predictions of attitudes more accurate). The second is to

examine accuracy of attitude predictions for topics where one was explicitly exposed to

the other's attitude towards the target as compared to when one was not. Further, we

manipulated topic involvement (high- and low-involvement topics) through a pretest.

Sixty participants were presented with 50 topics and they responded to four topic

involvement items on a 7-point scale for each topic ("How much do you personally care

about the following topic?" "How knowledgeable about the following topic do you

consider yourself?" "How important is the following topic to you?" "How certain are you

that the opinion you have just expressed is correct?" $\alpha=.93$). The responses of four items

were averaged to constitute the respondent's total involvement score for each topic. Twelve high-involvement topics were selected from the uppermost 25% and another twelve low-involvement topics were selected from the lowermost 25% on involvement score ($M_\text{low-involvement} = 2.16$ vs. $M_\text{high-involvement} = 5.32$; $t(60) = 17.5$, $p < .0001$). For the main study we used these 24 topics (appendix A) to examine whether this hypothesized ability was restricted to important issues and reliant on conscious motivation or was a more general ability.

Participants, Design and Procedures

One-hundred twenty eight undergraduate students (59 females, 69 males) were recruited from a large Midwestern university in exchange for course credit for their participation. Participants were randomly assigned an identification number that was the basis of forming groups of two members, and each group was randomly assigned to be either in a social interaction or no social interaction condition.

The study was divided into different phases. In the first phase, all participants provided some demographic information. During the second phase, the social interaction groups discussed four topics of high-involvement (e.g., "attitude towards Apple iPod") for two and a half minutes each (e.g., Topics A, B, C and D), while the no social interaction group did not. In the third phase, participants reported their own attitudes towards six high-involvement topics (two of which had been discussed, and four of which had not – e.g., Topics A, B, M, N, O and P) and predicted the attitudes of the other member of the dyad towards six other high-involvement topics (the other two discussed topics and four others non-discussed ones – e.g., C, D, Q, R, S and T). The other participant did the same but the topics for which s/he self-reported or predicted were

reversed (self-reported C, D, Q, R, S and T and predicted A, B, M, N, O and P). Thus, each participant made predictions about the other participants' attitudes that could be evaluated for accuracy against the other participant's self-reported attitude. In the fourth phase, all social interaction group participants discussed four topics of low-involvement (e.g., "attitude towards Kenmore water heater") while the no social interaction group participants did not. The final phase was similar to the third phase – participants predicted attitudes of the other member of the dyad and reported their own attitudes (see appendix A for all topics). The no social interaction group participants also made predictions about the other member of their dyad but they never had the experience of being in a group or discussing any topics with them. The no social interaction group data is important to argue against 'homogeneity in participants' – participants may not be accurately guessing each others' attitudes but may just have homogenous attitudes. The no social interaction group gives us measures of extant homogeneity and this argument is refuted if the no social interaction group performs worse than the social interaction group. A comparison across discussed and non-discussed topics is similarly important. While we would not argue that individuals can reproduce attitudes others are known to hold with absolute fidelity, it seems reasonable to presume that they should be able to predict others' expressed attitudes with greater fidelity than the non-expressed ones. If we find performance on the non-expressed targets to be comparable to the expressed ones, it would count as somewhat counter-intuitive and startling. Next, all participants provided their demographics, and answered four manipulation (same items used in pretest) check questions for topic involvement.

Results

A manipulation check on topic involvement score revealed a significant difference in high- and low-involvement topics ($M_{\text{high-involvemnet}} = 4.16$, $M_{\text{low-involvemnet}} = 2.79$; $t(127) = 18.43$, $p < .0001$), implying that the topic manipulation was successful.

A prediction error was calculated for each prediction as the squared difference between the attitude predicted by the participant (for the other participant) and the other participant's actual attitude. A smaller value of prediction error indicates less error (more accurate judgments). The reason we calculated prediction error as a square difference is because it is a more conservative measure. Additionally, we used prediction error as an absolute difference between the attitude predicted by the participant (for the other participant) and the other participant's actual attitude as well. Similar results were found for both—absolute and squared difference prediction error across all studies. Thus, in all our studies we report results using the squared difference between the attitude predicted by the participant (for the other participant) and the other participant's actual attitude as a measure of prediction error.

Since there is a nested nature to the data (i.e., multiple ratings nested within each participant), multilevel analyses were utilized. Multilevel modeling affords a number of advantages. It allows us to incorporate heterogeneity and use the correct variance partitioning. More importantly, it allows us to formally test the crucial cross-level interaction. That is, since error is dependent upon characteristics of the attitude object (discussed or not) as well as characteristics of the participant (no social interaction versus social interaction group) and attitude objects are nested within participants, multilevel modeling permits us to test this cross-level interaction.

We first tested if there were any differences in self-reported and predicted attitudes between the two conditions—social interaction and no-social interaction conditions. No difference were observed between self-reported attitudes ($M_{\text{social interaction}}$ = 2.1, SD=2.72 vs. $M_{\text{no social interaction}}$ = 2.42, SD=2.12; *NS*) as well as predicted attitudes ($M_{\text{social interaction}}$ = 2.4, SD=2.75 vs. $M_{\text{no social interaction}}$ = 2.84, SD=2.79; *NS*) across the social interaction and no-social interaction conditions suggesting that there was no regression to the middle of the attitude scale in these two groups to begin with.

Analyses yielded a main effect for social interaction, (F (1, 126) = 27.89, p < .0001) – being engaged in social interaction (comparing to no social interaction condition) made predictions more accurate ($M_{\text{social interaction}}$ = 3.83, SD=4.64 vs. $M_{\text{no social interaction}}$ = 8.2, SD=4.72). Importantly, this effect emerged for both discussed (written) topics ($M_{\text{social interaction}}$ = 4.2, SD=4.72 vs. $M_{\text{no social interaction}}$ = 8.1, SD=4.02; t (126) = 3.65, p < .0004) as well as non-discussed (non-written) topics ($M_{\text{social interaction}}$ = 3.66, SD=3.62, vs. $M_{\text{no social interaction}}$ = 8.25, SD=3.62; t (126) = 5.13, p < .0001) (figure 2.1).
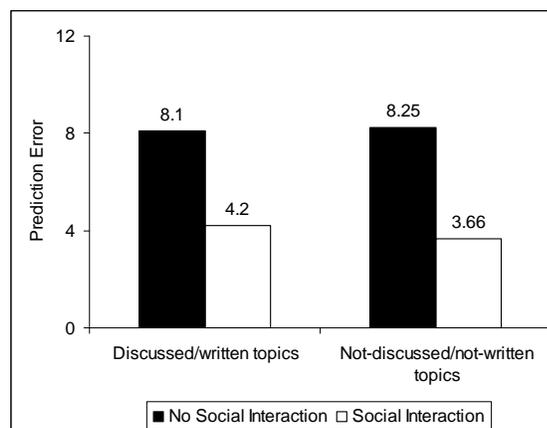
Figure 2.1: Influence of Social Interactions on Prediction Accuracy for Discussed and Non-Discussed Topics (Study 1a)

A main effect also emerged for topic involvement, (F (1, 126) = 6.83, p < .01) – but was tempered by a social interaction x involvement interaction, (F (1, 126) = 16.17, p < .0001). The interaction is graphed in figure 2.2 and was mainly due to less homogeneity in attitudes towards low-involvement targets – the no social interaction group were worse at predicting attitudes towards low-involvement targets rather than high-involvement targets ($M_{\text{low-involvement topics}}$ = 8.1, SD=3.62, vs. $M_{\text{high-involvement topics}}$ = 6.6, SD=3.42,; t (126) = 2.72, p < .01). Importantly, being engaged in social interactions rendered predictions equally accurate for high-involvement targets as well as low-involvement targets ($M_{\text{high-involvement topics}}$ = 4.1, SD=3.71, vs. $M_{\text{low-involvement topics}}$ = 3.5, SD=3.72; t (126) = 0.91, ns) (figure 2.2). In other words, engaging in social interaction made it possible for individuals to predict others' attitudes more accurately regardless of whether the other had shared his/her attitude, and also regardless of whether the topics were relatively important or unimportant to them. Thus, this ability to make accurate predictions about others' attitudes appears to be a general ability, unreliant on conscious motivation.
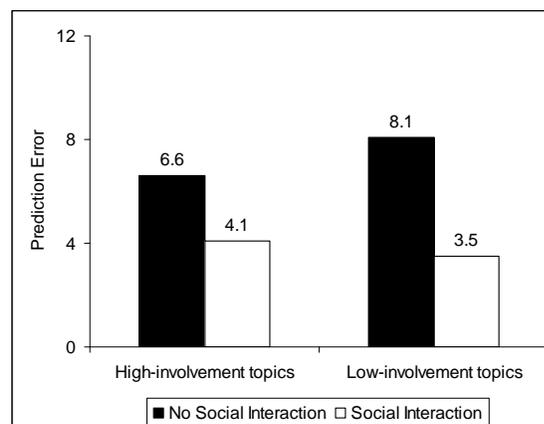
Figure 2.2: Influence of Social Interactions on Prediction Accuracy for High-involvement vs. Low-involvement Topics (Study 1a)

<u>Discussion</u>

Three points are worth noting. First, having discussed some topics in a social interaction condition rendered predictions of others' attitudes more accurate, compared to not being part of a social interaction condition. That is, knowing something about the other person (e.g., his/her attitudes towards some targets) made predictions more accurate compared to knowing nothing. Note further that this accuracy of prediction stretches not merely to targets that were discussed but also to targets that were never discussed – in fact, predictions about targets that were never discussed were as accurate as those towards targets which were discussed. While it is certainly possible that known attitudes may not be retrieved with perfect fidelity, the fact that others' attitudes towards unknown targets were predicted with as much accuracy as recalling known attitudes is particularly impressive, and surprising. In fact, while one may consider the performance of the social interaction group against the no social interaction group as a straw man (after all, knowing something instead of nothing should make predictions more accurate), the fact that one is able to predict attitudes towards non-discussed targets with as much fidelity as actually known attitudes is quite remarkable and we believe, quite deserving of the title of clairvoyance. Finally, note that these effects emerged for high-involvement and low-involvement topics – that is, for topics one was passionate about as well as those one did not care about, suggesting that the effect does not rely upon motivation.

In our initial exploration, participants were exposed to specific attitudes towards some target objects before making their prediction about discussed as well as non-discussed target objects. The results demonstrate that being in a social interaction condition facilitates accurate prediction of attitudes of other group members. Why would

being in a social interaction condition make someone a fairly quick clairvoyant with regards to attitudes held by others? One possible explanation could be based upon inter-item correlations. That is, maybe individuals are able to infer, based upon others' expressed attitudes, other attitudes that they might hold because we have noticed correlations in attitudes held by people. For instance, maybe someone who expresses a favorable attitude towards hybrid cars is a 'tree-hugger' who would, therefore, presumably like shopping at the local co-op for organic food and cous-cous. However, an examination of the study 1a data argues against this. The data from the no social interaction group participants was subjected to a factor analysis to capture this inter-item correlation. First off, there was no discernable theoretical account that we could concoct for the factor structure that emerged. Moreover, when we controlled for this factor structure, the influence of working in social interaction condition (versus not) remained significant. This suggests that it was not the inter-item correlations (captured in the factor structure) that was enhancing prediction accuracy. However, a study that more clearly ruled out this argument seemed called for – thus, the motivation for study 1b.

<div align="center">Study 1b: "You Don't Even Need To Tell Me What You Like"</div>

Given the counterintuitive nature of our findings, we wanted to discount the inter-item-correlation account of study 1a formally in study 1b. In this study participants played a puzzle based video game (titled "Myst") in groups of two and were instructed to interact with his/her partner in solving the puzzles in the game (the game is rather old and was released in 1993 – most participants did not recognize or know the game and none of them had played it). For our purposes, this allows participants to interact with each other (while playing the game), since the nature of the game involves solving puzzles and

making decisions about what to do next. As such, since individuals do not share their attitudes towards any explicit target object, it renders the inter-item correlation account moot. Since participants did not share their attitudes towards any topics whatsoever, individuals could not rely on inter-item-correlations and use that as a cue for predicting the attitude of other group members. Thus, if individuals display the ability to extract information about likes and dislikes from interactions (utilizing the nature of decisions made in solving puzzles in the game, body language etc) without access to any of the other participants attitudes, that would help us rule out the possibility of the inter-item-correlation account and would support our idea of individuals' ability to make shrewd, accurate guesses about attitudes of group members even when the specific attitude object was not shared.

<u>Participants, Design and Procedures</u>

One-hundred and twenty undergraduate students (58 females, 62 males) were recruited from a large Midwestern university in exchange for course credit for their participation. Participants were randomly assigned an identification number that was the basis of forming groups of two members each, randomly assigned to be either in the social interaction or no social interaction conditions.

We used Myst, a puzzle based video game, for this study. In the social interaction condition, participants in groups of two played this game together (using only one computer). In order to play the game, the players must explore the seemingly deserted island of Myst. The game is puzzle based and progress involves solving a number of non-linear puzzles utilizing hints and knowledge from disparate sources. During the game participants were instructed to interact with his/her group member in order to solve the

game. However, participants in the no social interaction condition played the same game

separately (using two computers placed side by side) without any interaction with each

other.

Each group played the game for forty minutes. After that, participants in both the

social interaction and no social interaction conditions reported their own attitudes

towards six high-involvement topics and six low-involvement topics (e.g., self reported

attitudes) and predicted the attitudes of the other member of the dyad towards twelve

other topics (six high-involvement topics and six low-involvement topics). The topics

were the same as those used in Study 1a and we used same manipulation check questions.

The other participant did the same but the topics for which s/he self-reported or predicted

were reversed. Thus, each participant made predictions about the other participants'

attitudes that could be evaluated for accuracy against the other participant's self-reported

attitude. The no social interaction group participants also made predictions about the

other member of their dyad but they never had the experience of being in a group or

discussing what to do next during the game etc.

<u>Results</u>

A manipulation check on topic involvement score (calculated same as study 1a)

revealed a significant difference in high- and low-involvement topics ($M_{\text{high-involvemnet}} =$

4.26, $M_{\text{low-involvemnet}} = 2.83$; $t(119) = 16.23$, $p < .0001$), implying that the topic

manipulation was successful.

We used an analytic process similar to study 1a. Prediction error was calculated

for each prediction as the squared difference between the attitude predicted by the

participant (for the other participant) and the other participant's actual attitude. A smaller value of prediction error indicates less error (i.e., more accurate judgments).

We first tested if there were any differences in self-reported and predicted attitudes between the two conditions—social interaction and no-social interaction conditions. No difference were observed between self-reported attitudes ($M_{\text{social interaction}}$ = 1.92, SD=1.72 vs. $M_{\text{no social interaction}}$ = 1.52, SD=1.22; NS) as well as predicted attitudes ($M_{\text{social interaction}}$ = 1.79, SD=1.48 vs. $M_{\text{no social interaction}}$ = 1.56, SD=1.21; NS) across the social interaction and no-social interaction conditions suggesting that there was no regression to the middle of the attitude scale in these two groups to begin with.
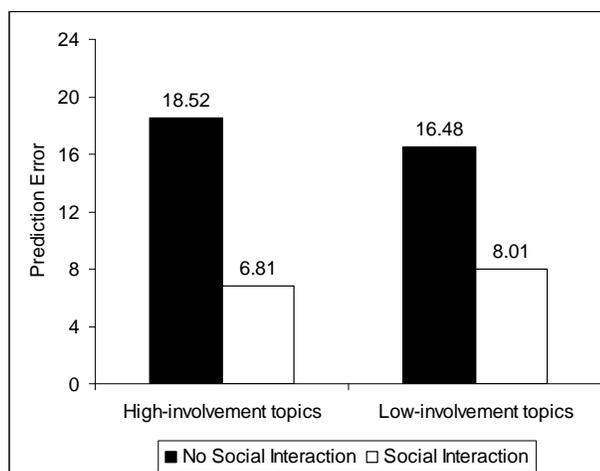
Figure 2.3: Influence of Social Interactions on Prediction Accuracy for High-involvement vs. Low-involvement Topics (Study 1b)

Analyses yielded a main effect for social interaction, (F (1, 118) = 22.78, $p <$ .0001) – being in a social interaction condition and being engaged in discussion made

predictions more accurate ($M_{\text{no social interaction}}$=17.51, SD=3.42 vs. $M_{\text{social interacttion}}$=7.43, SD=3.63). There was also a significant social interaction x topic involvement interaction, (F (1, 118) = 3.78, $p < .05$). The interaction is graphed in figure 2.3 and was mainly due to less homogeneity in attitudes towards low-involvement targets – the no social interaction group were worse at predicting attitudes towards high-involvement targets rather than low-involvement ones ($M_{\text{high-involvement topics}}$ = 18.52, SD = 4.12 vs. $M_{\text{low-involvement topics}}$ = 16.48, SD=3.94; t (118) = -1.04, ns). Importantly, working in a social interaction condition rendered predictions equally accurate for high-involvement as well as low-involvement topics ($M_{\text{high-involvement topics}}$ = 6.81, SD = 3.77 vs. $M_{\text{low-involvement topics}}$ = 8.01, SD=3.32; t (118) = 1.27, $p < .08$) (figure 2.3).

Discussion

The results demonstrate that being in a group facilitates accurate prediction of attitudes of other group members. This result argues against the inter-item correlation account (no items were discussed at all during this experiment, thus rendering that account moot). It is of note that study 1a had participants engage in a form of interaction that permitted a different, and perhaps greater, exchange of information (some attitudes shared plus body language etc.) compared to study 1b (problem solving style, body language etc.). The natural question that follows is to examine the impact of varying levels of interaction which we proceeded to do in study 1c.

Study 1c: "Varying Levels of Interactions"

In study 1a we have shown that being in a group and discussing some topics facilitates accurate prediction of the attitudes of other group members. In study 1b we have ruled out the possibility that the prediction accuracy was due to inter-item

correlation, as no items were discussed during this experiment. Thus, it seems that prediction accuracy was not reliant on inter-item correlation as a cue to improve prediction accuracy in any way. However, participants played the game together and were allowed to interact with group members while solving the game. One common theme in both studies is the interaction with the group members (i.e., social interaction condition) either through discussing topics (study 1a) or through solving puzzles (study 1b) – both led to accurate prediction of other members attitudes.

While studies 1a and 1b are useful for demonstrating this intriguing phenomenon and ruling out the inter-item correlation account, they are silent on what information is being gleaned during the course of the social interaction that facilitates the accurate prediction of others' attitudes. The main objective of study 1c was to vary the levels of social interaction to get a further understanding of the underlying factors that might facilitate or hinder accurate predictions. To this end, we set out to manipulate what people were exposed to during the social interaction.

How might individuals be so perceptive? From study 1a 1, knowing something about another's likes and dislikes appears to help. From study 1b, information exchanged casually during a game appears to help. In study 1a, plausible information exchanged were some likes and dislikes and reasons for the same, body language and facial expressions while communicating likes and dislikes etc. In study 1b, plausible information exchanged were kinds of goal-setting, decision-making/problem-solving styles and body language etc.

We thus set up a number of conditions in our next experiment to assess the impact of these different aspects of knowledge gained from interactions (likes/dislikes, reasons

for same, body language, more general problem solving styles etc). Study 1c comprised

of the following conditions – a control condition (no contact with the other), no

interaction (participant could see the other person but there was no social interaction –

thus, similar to the control condition of studies 1a and 1b), exchange only attitudes,

exchange only reasons, exchange attitudes + reasons, problem-solving interaction

(similar to social interaction condition of study 1b), attitudes + reasons + problem-solving

interaction, and free discussion interaction (similar to social interaction condition of study

1a). By examining the prediction accuracy fostered by each of these conditions, we might

be in a better position to infer the underlying process.

Participants, Design, and Procedures

Four hundred undergraduate marketing students (159 females, 241 males) from a

Midwestern university participated in exchange for partial course credit. Participants

were randomly assigned to one of the eight conditions. They were given an identification

number that was the basis of forming groups of two members each. Participants were

randomly assigned to one of eight social interaction conditions designed to assess

prediction accuracy. Depending on condition, some participants were not exposed to

others attitudes and were not involved in discussion (i.e., social interaction); others were

either exposed to others attitudes or reasons behinds their attitudes or were involved in

discussion (i.e., social interaction). At the end, all participants in all conditions reported

their own attitudes towards six high-involvement topics and six low-involvement topics

in a manner similar to study 1a (e.g., self reported topics A-L) and predicted the attitudes

of the other member of the dyad towards twelve other topics (six high-involvement topics

and six low-involvement topics as in study 1a, e.g., M-X). The other participant did the

same but the topics for which s/he self-reported or predicted were reversed (self-reported M-X and predicted A-L). Thus, each participant made predictions about the other participants' attitudes that could be evaluated for accuracy against the other participant's self-reported attitude. Participants were randomly assigned into one of the eight conditions and the tasks variations for each condition are presented below.

Control condition (C). Participants made predictions about the other member of their dyad but never saw them, leave alone or interact with them. They were asked to predict the attitudes of the person who sat (will sit) in the same chair in the previous (next) session. One could thus conceptualize this as a stricter control group than those used in studies 1a and 1b. After all, if one can see a person, it might be possible to make inferences based on dress sense, body posture and language, facial expressions etc.

No interaction condition (NIC). Participants made predictions about the other member of their dyad but never had the experience of being in a group or discussing any topics or exchanging their attitudes or reasons with other group members – in other words, while they could see the person by virtue of the being in the same room (and could thus form impressions or make inferences from visual information), they did not have the experience of being in a social interaction with them. This condition is thus similar to the no social interaction conditions of studies 1a and 1b.

Attitude exchange condition (A). Participants in this condition only exchanged their attitudes. They filled out a separate booklet where they marked their attitudes towards certain targets. Then they exchanged this booklet with the other member without discussing anything. They did not exchange the reasons behind those attitudes nor were they engaged in any social interaction or discussion. In other words, this was a condition

where the only information gleaned about the other person was his/her likes and dislikes towards some targets. Subsequently, participants provided their self attitudes and predicted attitudes of the other member of the dyad towards a number of topics.

Reason exchange condition (R). Participants in this condition only exchanged the reasons for their attitudes (i.e., the other member of the dyad only read the reasons for his/her attitudes). In a separate booklet participants wrote down why they held certain attitudes towards the topics presented in the booklet. Then they exchanged this booklet with the other member without giving them their actual attitudes towards topics presented in the booklet. They were not engaged in any social interaction or discussion. While it seems straightforward enough to infer one's attitudes from the reasons, we felt including this condition would permit us to see whether reasons contributed more than just the attitudes. That is, to examine whether reasons provided evidence of over-arching goals, which could be used to predict other attitudes –for example, having a positive attitude towards hybrid cars because one is concerned about the environment (versus one likes the lower fuel bills) could help predict that one would shop at the local co-op (versus at WalMart). After that all participants provided their self attitudes and predicted attitudes of other members towards a number of topics.

Attitude and Reason exchange condition (A+R). Participants in this condition exchanged their attitudes as well as reasons behind those attitudes (i.e., other member of dyad read both the actual attitudes and reasons for his/her attitudes). They filled out two separate booklets. In the first booklet they marked their attitudes towards the given topics. Then in a second booklet they wrote the reasons behind those attitudes. They then proceeded to exchange both these booklets with the other member. They were not

engaged in any social interaction or discussion. Subsequently, participants provided their self attitudes and predicted attitudes of other members towards a number of topics.

Problem-solving Interaction condition (I). Participants in this condition solved cross word puzzles, anagrams and Sudoku together and they were instructed to interact with the other member of the dyad in order to solve the problems presented in the booklet. After that, they provided their self attitudes and predicted attitudes of other members towards a number of topics. This condition is thus similar to the social interaction condition of study 1b.

Problem-solving Interaction, Attitude and Reason exchange condition (I+A+R). Participants in this condition interacted with other member and exchanged their attitudes as well as reasons behind those attitudes with the other member of dyad. Participants in this condition filled out three separate booklets. The first booklet included cross word puzzles, anagrams and Sudoku. Participants were instructed to interact with the other member of the dyad to solve the problems presented in the booklet. After that, participants filled out a second booklet where they reported their attitudes towards some topics. Then, in a third booklet they wrote down the reasons for their specific attitudes. Then, members of each dyad exchanged both the second and third booklets with each other. After that they provided their self attitudes and predicted attitudes of other members towards a number of topics.

Discussion condition (D). Participants in phase one discussed four topics of high-involvement (e.g., "attitude towards Dell Notebook") for two and a half minutes each (e.g., Topics A, B, C and D). In phase two, participants reported their own attitudes towards six high-involvement topics (two had been discussed, and four had not – e.g.,

Topics A, B, M, N, O and P) and predicted the attitudes of the other member of the dyad

towards six other high-involvement topics (the other two discussed topics and four others

non-discussed ones – e.g., C, D, Q, R, S and T). The other participant did the same but

the topics for which s/he self-reported or predicted were reversed (self-reported C, D, Q,

R, S and T and predicted A, B, M, N, O and P). Thus, each participant made predictions

about the other participants' attitudes that could be evaluated for accuracy against the

other participant's self-reported attitude. Then, in phase three they discussed four topics

of low-involvement (e.g., "attitude towards Kenmore water heater") and finally similar to

the second phase – participants predicted attitudes of the other member of the dyad and

reported their own attitudes. This condition thus was identical to the social interaction

condition of study 1a.

Results

We first tested if there were any differences in self-reported and predicted

attitudes across all conditions. No difference were observed between self-reported

attitudes (M_C= 1.12, SD=.69 vs. M_{NIC}= 1.31, SD=.59 vs. M_A= 1.29, SD=.67 vs. M_R=

1.33, SD=.72 vs. M_{A+R}= 1.19, SD=.75 vs. M_I= 1.35, SD=.81 vs. M_{I+A+R}= 1.18, SD=.41

vs. M_D= .54, SD=.63; *NS*) as well as predicted attitudes (M_C= 1.54, SD=.89 vs. M_{NIC}=

1.51, SD=.89 vs. M_A= 1.69, SD=.97 vs. M_R= 1.63, SD=.82 vs. M_{A+R}= 1.49, SD=.76 vs.

M_I= 1.55, SD=.91 vs. M_{I+A+R}= 1.48, SD=.81 vs. M_D= .84, SD=.73; *NS*) across the social

interaction and no-social interaction conditions suggesting that there was no regression to

the middle of the attitude scale in these two groups to begin with.

We used an analytic approach similar to study 1a. A prediction error was

calculated for each prediction as the squared difference between the attitude predicted by

the participant (for the other participant) and the other participant's actual attitude.

Analyses yielded a main effect for conditions, $(F\,(1,\,392) = 7.01, p < .0001)$. Participants

in the "control condition" and the "no interaction condition" were considerably worse in

their ability to accurately predict each other's attitudes ($M_C = 19.51$ vs. $M_{NIC} = 17.09$).

This poor ability to predict others' attitudes was followed in order by the "attitude

exchange condition" ($M_A = 12.27$), the "reason exchange condition" ($M_R = 10.89$), the

"attitude and reason exchange condition" ($M_{A+R} = 10.03$), "interaction condition" ($M_I =$

9.66) "interaction, attitude and reason exchange condition" ($M_{I+A+R} = 7.34$), and the

"discussion condition" ($M_D = 6.33$) (figure 2.4).
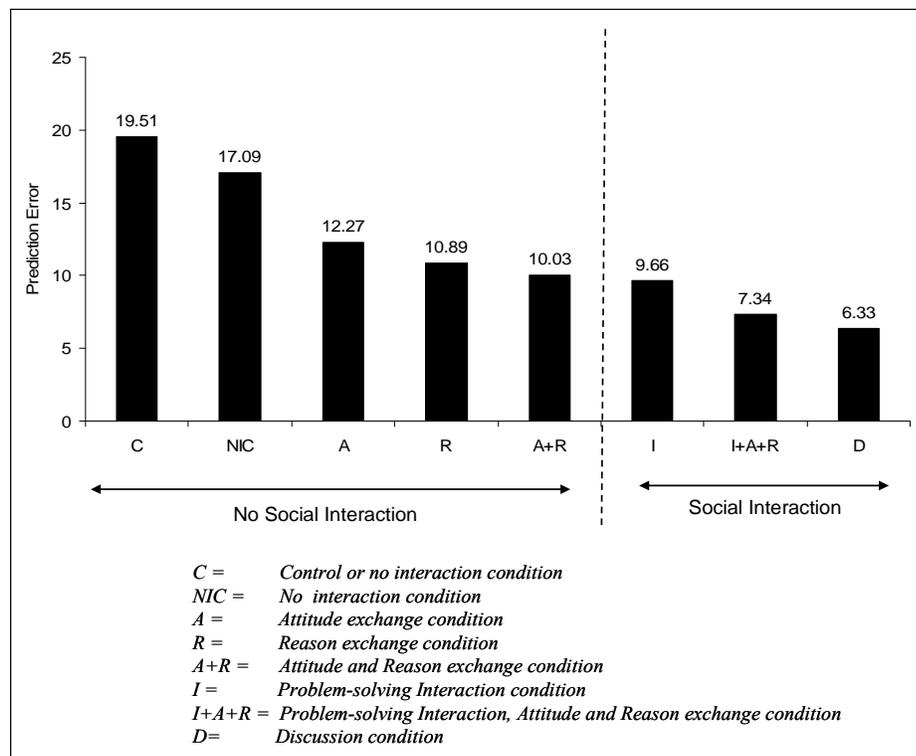
Figure 2.4: Levels of Social Interactions on Prediction Accuracy (Study 1c)

Both control conditions were significantly different from all other conditions, however they were not different from each other (t (392) = -.99, *ns)*. The three 'no social interaction' conditions (i.e., Attitude exchange condition (A), Reason exchange condition (R), and Attitude and Reason exchange condition (A+R) were not significantly different from each other. This suggests that being exposed to some information about other participants' attitudes and/or reasons behinds those attitudes significantly improve the prediction accuracy comparing to control condition (i.e. no exposure at all). The difference between the Problem-solving Interaction condition (I) was not significantly different from Problem-solving Interaction, Attitude and Reason exchange condition (I+A+R) (t (392) = .95, *NS)* but was significantly different (t (392) = -4.04, p < .0001) from the Discussion condition (D). Also, I+A+R was significantly different from Attitude exchange condition (A) (t (392) = 2.02, p < .04); but was not significantly different from Reason exchange condition (R) (t (392) = .42, *NS*) and Attitude and Reason exchange condition (A+R) (t (392) = 1.10, *NS*). The Discussion condition (D) was significantly different from all conditions but Problem-solving Interaction and Attitude and Reason exchange condition (I+A+R) (t (392) = 0.42, *NS)*.

Discussion

Several observations are worth making. First, information (any information) is clearly better than no information (the control condition was significantly different from every other condition). Second, knowing another person's attitudes or the reasons behind those attitudes makes predictions more accurate (although the lack of difference between these conditions suggests some redundancy in the information gleaned from these sources). Third, there is clearly information being gleaned in problem-solving

interactions. It is unclear from these data what that information is – plausible candidates might include goal setting, what one strives for, general emotional reactions, attributions about personality from body language, dress etc. Fourth, the information being gleaned from the problem solving interaction is different from information gleaned from attitudes and reasons (since I+A+R does better than A+R and I). Finally, an unstructured discussion of one's attitudes presumably yields all this information, as evidenced by the greatest accuracy.

As revealed by the results, prediction accuracy has notably increased with increasing level of exposure to information and social interaction between members of dyad. It seems that revelation of only written information about attitudes or reasons behind those attitudes boosts the level of prediction accuracy to some extent but it is more likely that during the discussion (i.e., social interaction) people exchange not only attitudes and reasons behind those attitudes but also glean other information which in turn makes prediction more accurate.

Two clues appear important in these data. First, information about some attitudes held by an individual helps prediction of other attitudes s/he might hold, especially if one knows the reasons behind those attitudes. Second, social interaction appears to amplify these effects. The more interesting question is why social interaction amplifies the effect of information? We suggest that social interaction provides one with information about the other person (which is unavailable in a summary cognitive report delivered by the other person) that allows one to simulate the other person's mind accurately – that is, to engage in an empathic process of temporarily simulating the other person's mind and

experiencing their reactions as though they were happening to oneself (in other words, to metaphorically inhabit another's skin).

Social interaction obviously takes place on many levels, just one of which is informational exchange. Non-verbal parts of interactions presumably allow us to assess aspects such as extent of emotional reactance towards the targets, body language and so forth. Specifically, we probably obtain social (non-cognitive) knowledge that facilitates the empathetic simulation idea outlined. We are obviously not suggesting that individuals articulate things in such detail consciously but rather that they are capable of assessing these underlying reasons for likes and dislikes spontaneously and automatically. In other words, the reason social interaction amplifies the effects of information might be the fact that social interaction might engage empathic processes that permit inferences of underlying reasons for likes and dislikes with greater fidelity.

This notion –that social interaction might foster empathic simulations of another's mind and attitudes – were tested in the following two studies (2a and 2b) utilizing two general approaches. The first approach utilizes individual differences in empathy that map onto the processes we have outlined – we should then expect to find this phenomenon of social clairvoyance moderated by these individual differences (study 2a). Second, we experimentally manipulate the ability to engage in the empathic processes we have outlined to garner further evidence for the same (study 2b).

CHAPTER 3

EMPATHETIC RESPONDING MODERATES SOCIAL CLAIRVOYANCE

Study 2a: "Interpersonal Reactivity"

Taken together the first three studies provide initial evidence for social clairvoyance. We have suggested that individuals are particularly adept at reading affective and emotional signals indicating liking and disliking – that is, we have outlined an empathic process. Empathy is a process rooted in the emotions. If this is the case, we should find this clairvoyance moderated by the extent to which one is adept at reading emotions. Finding evidence for these propositions was the goal of study 2a.

Recall that we have outlined an organism that is capable of inhabiting another's skin, of simulating another's internal processes. Theorists have suggested that humans have the somewhat unique ability of prospection or simulating future scenarios (Gilbert and Wilson 2007). We have suggested a similar process, except that one simulates (in one's mind) the internal states of another person. Further, we have suggested a general ability, not reliant on motivation (we draw the reader's attention to the lack of moderation by topic involvement). This, in turn, suggests a set of mental modules operating very fast and plausibly beyond conscious awareness. One need not look far for examples of remarkable facility in this regard. One can often infer another's moods and emotions from very little information – often little needs to be said, especially with members of a close social group. In this respect, emotional information could be said to possess greater volume. Emotions are also the prototype fast mental module, and have often been characterized as 'cognitive interrupts' to reallocate processing resources. We specifically

suggest that the phenomenon we have documented should therefore be moderated by the extent to which one can emotionally simulate another person's internal state.

The capacity to have an empathic response to another person is one of the most important elements of higher social functioning. During social interactions we manifest our inner intentions and thoughts by means of overt behavior, while simultaneously trying to figure out what the intentions and thoughts of others are, when witnessing their behavior. Detecting another person's intentions helps anticipate this person's future actions (Gallese and Umilta 2006). Empathy provides powerful motivation to address the needs of others in one's social immediate group and helps form bonds of affiliation and affection that support long-term social commitment in one's social environment. Perhaps even more importantly, empathy is self-reinforcing for both the respondent and the recipient in a social group and allows social relationships to be experienced as intrinsically enjoyable and meaningful, even beyond any objective benefits such relationships may provide.

The main objective of this study was to assess the role of dispositional empathy of individuals on prediction accuracy while engaged in social interaction in a group and being exposed to others opinions. We used the Interpersonal Reactivity Index, developed by Davis (1980, 1983), to examine the role of dispositional empathy of individuals on prediction accuracy for discussed as well as non-discussed target objects.

Participants, Design and Procedures

One-hundred and sixty six undergraduates (94 females, 72 males) at a large Midwestern university participated in the study and were randomly assigned an identification number that was the basis for forming groups of two members. Participants

received partial course credit for their participation and were randomly assigned to one of the two conditions – social interaction or no social interaction condition.

Davis's (1980) Interpersonal Reactivity Index (IRI) measure was used in this study to operationalize dispositional empathy of individuals. IRI is a measure of dispositional empathy that takes as its starting point the notion that empathy consists of a set of separate but related constructs. This is a 28-item instrument, each tapping on facet of empathy (anchored by 1 = "does not describe me well", 5 = "describe me very well").

Participants worked in groups of two and were randomly assigned into social interaction and no social interaction conditions. The entire study was divided into six phases. The first five phases were same as study 1a and we used the same stimuli as study 1a. In phase six, all participants answered the Interpersonal Reactivity Index (IRI) scale (Davis, 1980) to assess dispositional empathy of individuals.

Results

We first tested if there were any differences in self-reported and predicted attitudes between the two conditions—social interaction and no-social interaction conditions. No difference were observed between self-reported attitudes ($M_{\text{social interaction}}$ = 1.92, SD=1.62 vs. $M_{\text{no social interaction}}$ = 1.52, SD=1.12; NS) as well as predicted attitudes ($M_{\text{social interaction}}$ = 1.79, SD=1.61 vs. $M_{\text{no social interaction}}$ = 1.56, SD=1.29; NS) across the social interaction and no-social interaction conditions suggesting that there was no regression to the middle of the attitude scale in these two groups to begin with.

We used an analytic process similar to earlier studies. Prediction error was calculated for each prediction as the squared difference between the attitude predicted by the participant (for the other participant) and the other participant's actual attitude.

Analyses yielded a main effect for social interaction (F (1, 162) = 28.66, p < .0001) –

being engaged in social interaction (comparing to no social inter action condition) (M_{social}

$_{interaction}$ = 8.01, SD = 2.2 vs. $M_{no\ social\ interaction}$ = 17.34, SD = 2). No main effects emerged

for empathy. There was a significant social interaction x empathy interaction (F (1, 162)

= 9.29, p < .003).

For purposes of exposition, we conducted additional analysis using median splits

that characterized participants as high or low on empathy. Analyses yielded a significant

interaction between social interaction and empathy (F (1,162) = 11.8, p < .001) such that

participants who were high on empathy and were exposed to some attitudes of others

were more accurate in predicting others' non-revealed attitudes compared to those

participants who were either not exposed to others' attitudes (no social interaction) or

were low on empathy (figure 3.1).
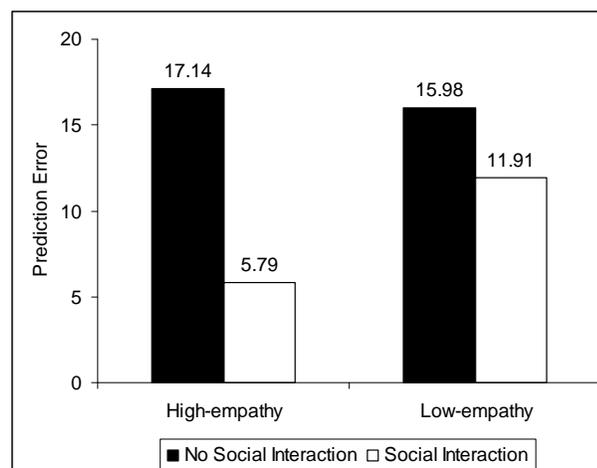
Figure 3.1: Level of Empathy on Prediction Accuracy (Study 2a)

<u>Discussion</u>

As predicted, empathic processing did moderate the phenomenon with individuals high on these dimensions being able to perform the feat of predicting others' attitudes from scant information better than individuals low on these dimensions. The results of study 2a support the idea that social clairvoyance needs both empathic processing as well as social interaction as necessary condition.

<u>Study 2b: "Compromising Empathic Processing"</u>

The data from first three studies suggest that a very social process underlies this phenomenon. This was reinforced by study 2a which implicate empathy as key mechanisms in this phenomenon. A straightforward way to test this formally would be to design situations that would create social perceptions that would either foster or hinder empathic processing. We utilized a subtle priming approach to create this mindset.

Participants in the study were provided with pairs of black and white drawings and they were asked to either find the similarities or dissimilarities between each pair of drawings. We reasoned that looking for similarities would foster a mindset that would carry over to subsequent tasks. If the subsequent task involved another individual, the similarity seeking frame of mind would thus increase the likelihood of perceiving the other individual as similar to oneself and thus part of one's social group and therefore be more likely to engage empathic processing. In contrast, looking for dissimilarities would foster a mindset of looking for differences. In the subsequent task involving another individual, the dissimilarity seeking frame of mind would increase the likelihood of perceiving the other as dissimilar to oneself and thus hinder perceiving the other as part of one's social group. In contrast, it would be likely to reinforce the perception of the

other individual being a separate entity unto himself/herself, distinct from oneself. This would be less likely to engage empathic processing routines. Thus, even if one was to be engaged in some social interaction, since the other person is not perceived as part of one's social group, empathic routines are not engaged and the social clairvoyant should be absent. We therefore propose that the similarity condition should facilitate the social clairvoyance phenomenon, while the dissimilarity condition should hinder it.

Participants, Design and Procedures

One-hundred undergraduate participants (55 females, 45 males) at a large Midwestern university participated in the study and were randomly assigned an identification number that was the basis for forming groups of two members. Participants received partial course credit for their participation and were randomly assigned to one of the four between-subject conditions. The design of this experiment was a 2 (priming task: similarity vs. dissimilarity) x 2 (social interaction: no social interaction vs. social interaction) x 2 (topics: discussed vs. not) mixed factorial design with the first two factors manipulated between participants and the last within. Participants were asked to compare six pairs of black and white artistic drawings (see example of such stimuli in figure 3.2).

Upon arrival, participants were randomly assigned to similarity and dissimilarity condition. In the similarity (dissimilarity) condition, after being exposed to each pair of drawings, participants were asked to write as many similarities (differences) as they could find in the pair of drawings in 3 minutes (Mussweiler 2001). Then half of the participants from each condition (the similarity and dissimilarity mindset task) were assigned to the social interaction and no social interaction condition respectively, where they formed groups of two that discussed, or wrote about four high-involvement topics

for two and a half minutes each (same as study 1a). All participants then provided self

attitudes towards six high-involvement topics (two of which had been discussed, and four

of which had not) and predicted the attitudes of the other member of the dyad towards six

other high-involvement topics (the other two discussed topics and four others non-

discussed ones). The other participant did the same but the topics for which s/he self-

reported or predicted were reversed. Next, all social interaction group participants

discussed six topics of low-involvement while the no social interaction group participants

did not. In the final phase all participants predicted attitudes of the other member of the

dyad and reported their own attitudes. Then, participants provided their guesses on the

purpose of the experiment, which was used to see if anyone had guessed the research

hypothesis.
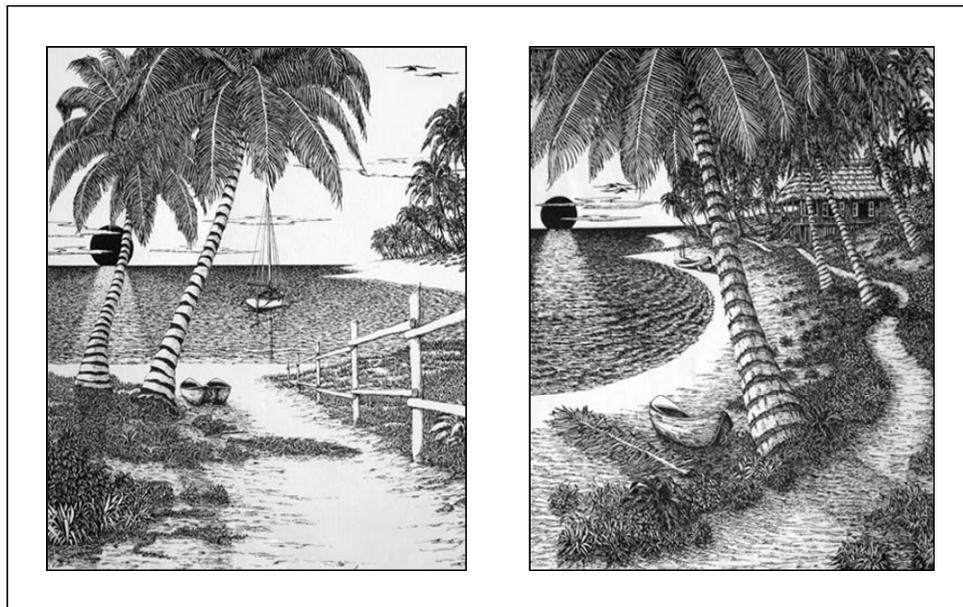
Figure 3.2: Example of Picture Stimuli (Study 2b)

Results

 We first tested if there were any differences in self-reported and predicted

attitudes between the two conditions—social interaction and no-social interaction

conditions. No difference were observed between self-reported attitudes ($M_{\text{social interaction}}$ =

1.42, SD=1.12 vs. $M_{\text{no social interaction}}$ = 1.32, SD=1.02; *NS*) as well as predicted attitudes

($M_{\text{social interaction}}$ = 1.69, SD=1.18 vs. $M_{\text{no social interaction}}$ = 1.66, SD=1.11; *NS*) across the

social interaction and no-social interaction conditions suggesting that there was no

regression to the middle of the attitude scale in these two groups to begin with.

 As in the earlier studies, prediction error was calculated by squaring the

difference between predicted and actual attitudes and this served as a measure of

accuracy. Analyses yielded a main effect for the priming task, ($F (1, 96) = 10.38$, p <

.002), which was qualified by a priming task x social interaction, ($F (1, 96) = 3.6$, $p =$

.06). Decomposition of the interaction revealed that while being in the group that

permitted social interaction made predictions more accurate, this was true only for those

who had performed the similarity priming task and not for those who had performed the

dissimilarity priming task. Specifically, social interaction after the similarity task made

predictions significantly more accurate than social interaction after the dissimilarity task

($M_{\text{similarity}}$ = 5.43, SD=2.1 vs. $M_{\text{disimilarity}}$ = 16.99, SD=2.5; $t = 3.64$, $p < .0004$). However,

for no social interaction condition there was no significant difference ($M_{\text{similarity}}$ = 10.11,

SD=2.3 vs. $M_{\text{disimilarity}}$ = 13.17, SD=2.4; *ns*) (figure 3.3).

Discussion

 As suggested by our conceptualization, it is not just social interaction that matters.

It is the perception of the other as being a part of one's social group that in turn engages

the empathic routines that permit social clairvoyance. These results allow us to

circumscribe the mental modules required for performing this feat a little more.

Attending to others during a social interaction and taking their perspective should enable

the 'inhabiting of another's skin' required to infer overarching motivations they might

possess.
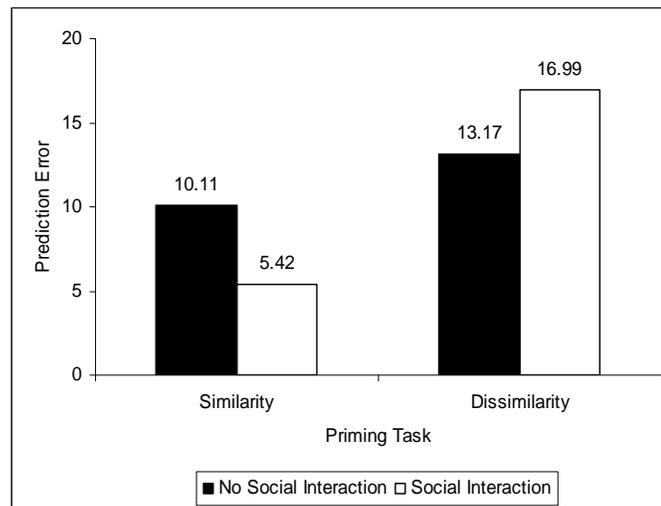
Figure 3.3: Exclusionary Mindset that is Less Likely to Include Others as Part
of a Social Group Disables Social Clairvoyance, Even in The Presence of Social
Interaction (Study 2b)

CHAPTER 4

ATTITUDINAL CONTAGION

Study 3a: "I Like What You Like"

Thus far, we have provided evidence for surprisingly accurate predictions of others' attitudes. Understanding other's actions and emotions is believed to facilitate efficient human communication. Based on our conceptualization, we suggested that empathic responding might enable us to make faster and more accurate predictions of other people's needs and actions by putting ourselves in the 'mental shoes' of another and simulating his or her experience/reactions in our own mind as if they were our own. As a result, a shifting in one's own attitudes (attitudinal contagion) might happen because of the presence of other's reactions via simulation while reporting one's own attitudes towards specific target.

This aspect—that accurate prediction of others' attitudes would bias one's own attitude—was tested in this study. Participants were exposed to the attitudes of group members about some targets, but not others. Participants then reported their attitudes towards all targets, which allowed us to examine whether contagion effects emerged for discussed, as well as non-discussed, attitude objects. A group that did not discuss any attitude object (i.e., never experienced being part of a group) provides an important no social interaction to argue against the existing group homogeneity counter-explanation.

Participants, Design and Procedures

One hundred and sixty four undergraduate participants (76 females, 88 males) at a large Midwestern university participated in the study and were randomly assigned an identification number that was the basis for forming groups of three members.

Participants received partial course credit for their participation and were randomly assigned to one of the two conditions – social interaction or no social interaction condition. All participants first provided some basic demographic information. During phase two, social interaction groups discussed six topics for two and a half minutes each (e.g., "attitude towards Dasani bottled water"). No social interaction group participants listed their thoughts on these topics individually (i.e., they were not exposed to the attitudes of others). Finally, both social interaction and no social interaction participants responded with their attitudes towards 18 topics (see appendix B). Among these, six had been discussed by the social interaction groups and written about by the no social interaction group and served to test attitudinal contagion resulting from explicit exposure to others' attitudes, and 12 had not been discussed (e.g., "attitude towards Ethan Allen furniture") by the social interaction group or the no social interaction group and served to test attitudinal contagion from accurate prediction of other group members' attitudes which biased one's own attitude.

The no social interaction group data is important to argue against 'homogeneity in participants' – participants may not be shifting their attitudes towards other group members' attitudes but may just have homogenous attitudes. The no social interaction group gives us measures of extant homogeneity and this argument is refuted if the no social interaction group are worse at shifting their attitudes than the social interaction group. The dependent variables of interest was a measure of individuality, calculated as the squared difference of an individual's rating from the group mean, representing the 'individualism' (or lack thereof) shown by that individual – the smaller the deviance

score, the less individualism (or the greater the group influence on the individual's attitude).

Results

We first tested if there were any differences in self-reported and predicted attitudes between the two conditions—social interaction and no-social interaction conditions. No difference were observed between self-reported attitudes ($M_{\text{social interaction}}$ = 1.45, SD=.71 vs. $M_{\text{no social interaction}}$ = 1.52, SD=.89; *NS*) as well as predicted attitudes ($M_{\text{social interaction}}$ = 1.49, SD=.48 vs. $M_{\text{no social interaction}}$ = 1.56, SD=.21; *NS*) across the social interaction and no-social interaction conditions suggesting that there was no regression to the middle of the attitude scale in these two groups to begin with.

Multilevel analyses yielded a main effect for the social interaction condition (F (1, 158) = 5.2, p < .03). The social interaction group, which had worked as a group and interacted with group members, had smaller deviances ($M_{\text{social interaction}}$ = 1.87) than the no social interaction group ($M_{\text{no social interaction}}$ = 2.48). Importantly, this was not moderated by whether the topic had been discussed or not (F = .01) – social influence emerged for the discussed topics as well as the non-discussed topics. For discussed topics, social interaction group participants showed marginally smaller individuality score from the group mean than the no social interaction group ($M_{\text{social interaction}}$ = 2.13, SD=1.2 vs. $M_{\text{no social interaction}}$ = 2.87, SD=1.3; t (158) = 1.91, p < .06). For non-discussed topics also, the social interaction group showed smaller deviance compared to the no social interaction group ($M_{\text{social interaction}}$ = 1.69, SD=1.3 vs. $M_{\text{no social interaction}}$ = 2.58, SD=1.1; t (158) = 1.96, p < .05) (figure 4.1).
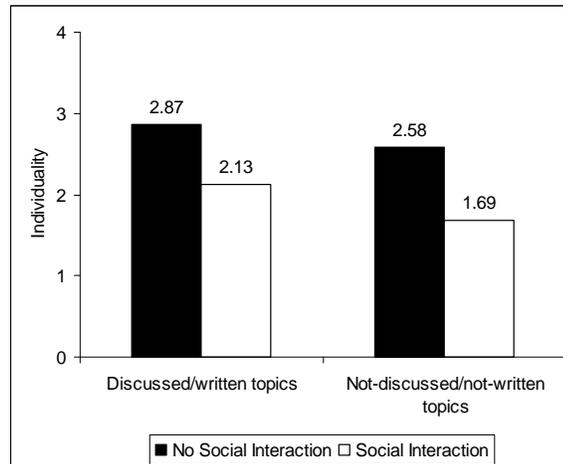
Figure 4.1: Influence of Social Interactions on Attitudinal Contagion (Study 3a)

Discussion

The results demonstrate that being exposed to group attitudes towards certain attitude objects results in individuals' attitudes shifting in the direction of the group attitude for the discussed attitude objects, but startlingly, also for non-discussed attitude objects, thus supporting our thesis for attitudinal contagion.

Study 3b: "Social Clairvoyance Mediates Attitudinal Contagion"

We have demonstrated that individuals are very good at inferring the preferences of close others (studies 1a, 1b and 1c), even when no information about these attitudes or preferences is directly voiced. Thus, exposure to a person allows one to make reasonably good inferences about the attitudes s/he might hold, and such insight is automatically used in constructing one's own attitude (study 3a). The main objective of this study was to provide better support for this proposition by showing that social clairvoyance

mediates attitudinal contagion— that is, social interaction --> social clairvoyance --> attitudinal contagion.

The secondary objective was to rule out an alternate explanation that participants did not use social projection as a cue for accurate prediction. Social projection can be defined as a process by which people come to expect others to be similar to themselves. Using one's own dispositions or preferences, people can make quick predictions of what others are likely to do—often correctly (Krueger 1998). In other words, social projection suggests that perceivers consult their own attitudes, behaviors, and characteristics and assume others share them—i.e., the tendency of social projection is realized when the others are first observed as being similar to the self on some background dimension that is relevant to the object under judgment.

The notion that perceivers project to those who appear similar may further suggest that people are more likely to use projection in a social setup where they have opportunity to interact with others to get some idea about interpersonal similarity among group members. Thus, it seems likely that, during social interaction people can predict others attitudes towards a variety of target object accurately using projection strategy, when they view members of their social group as being similar to themselves. However, without social interaction, one may not have enough information about others and thus they are less likely to use social projection as a strategy to predict others attitudes for target objects. That is, in a social interaction condition comparing a no social interaction condition, maybe individuals are able to infer, based upon others' expressed attitudes, other attitudes that they might hold because individuals gain more information about how

similar the other members are and hence they use the knowledge of himself/herself more confidently as a basis for their inference of other members attitudes.

We wanted to rule out the projection idea in two ways in this study. First, if individual's own attitude is indeed used to predict the attitudes of similar others, then this would suggest individual's own attitudes as a significant predictor of others' attitude after controlling for the level of similarity (between self and other member). Second, this would also suggest the mediating role of attitudinal contagion on the effect of social interaction on social clairvoyance—that is, social interaction --> attitudinal contagion --> social clairvoyance.

Participants, Design and Procedures

One hundred and forty four undergraduate participants (70 females, 74 males) at a large Midwestern university participated in the study and were randomly assigned an identification number that was the basis for forming groups of two members. Participants received partial course credit for their participation and were randomly assigned to one of the two conditions – social interaction or no social interaction condition.

The entire study was divided into six phases. The first five phases of this study were the same as study 3a—we used the same procedure and the same stimuli. In phase six, all participants in both the social interaction and no social interaction conditions reported their own attitudes towards all topics (eight had been discussed by the social interaction groups and written about by the no social interaction group and served to test attitudinal contagion resulting from explicit exposure to others' attitudes, and 16 had not been discussed by the social interaction group or written by the no social interaction

group and served to test attitudinal contagion from accurate prediction of other group

members' attitudes which biased one's own attitude).

The dependent variables of interest were (1) a measure of prediction error,

calculated as the squared difference between the attitude predicted by the participant (for

the other participant) and the other participant's actual attitude—a smaller value of

prediction error indicates less error (i.e., more accurate judgments), and (2) a measure of

individuality, calculated as the squared difference of an individual's rating from the other

participant's self-reported attitudes, representing the 'individualism' (or lack thereof)

shown by that individual – the smaller the deviance score, the less individualism (or the

greater influence of other member on the individual's attitude).

<u>Results</u>

We first tested if there were any differences in self-reported and predicted

attitudes between the two conditions—social interaction and no-social interaction

conditions. No difference were observed between self-reported attitudes ($M_{\text{social interaction}}$ =

1.93, SD=1.12 vs. $M_{\text{no social interaction}}$ = 1.63, SD=1.22; NS) as well as predicted attitudes

($M_{\text{social interaction}}$ = 1.73, SD=1.4 vs. $M_{\text{no social interaction}}$ = 1.53, SD=1.2; NS) across the social

interaction and no-social interaction conditions suggesting that there was no regression to

the middle of the attitude scale in these two groups to begin with.

Projection. We tested whether individual's own attitude was used to predict the

attitudes of others—that is, whether social projection was used as a strategy to predict

other's attitude correctly after controlling for the level of similarity (between self and

other member). We calculated similarity score as a square difference of an individual's

self-reported attitudes from the other participant's self-reported attitudes, for discussed

topics only (reason being that discussed topics provide one participant better judgments about how similar the other participant is during social interaction). The smaller the similarity score, the less similar the group members are. To calculate the measure of projection, within-participant multiple regression models were conducted. For each participant, his or her predicted attitude for other participant (i.e., predicted attitude of participant 2 by participant 1) for the target objects were predicted by his or her own response (i.e., self-reported attitudes of participant 1). Standardized beta weights (for self) from each participant's multiple regression model were used as a measure of projection (i.e., the extent to which self-responses predicted target estimates).

We conducted regression analysis using projection measure, similarity score and interacting term as independent variables that predict their prediction of the other's attitude for both social interaction and no social interaction condition separately. For social interaction condition, the result revealed that projection measure ($\beta =.68$, $t(141) = 1.12$, *NS*), similarity measure ($\beta =.91$, $t(141) = 1.52$, *NS*), and interaction ($\beta =.11$, $t(141) = .98$, *NS*) were not a significant predictor of other participants' attitudes. Similarly, for no social interaction condition, projection measure ($\beta =.79$, $t(141) = 1.31$, *NS*), similarity measure ($\beta =1.31$, $t(141) = 1.62$, *NS*), and interaction ($\beta =.19$, $t(141) = .02$, *NS*) were not a significant predictor of other participants' attitudes. This result argues against the projection account.

Social Clairvoyance. Multilevel analyses yielded a main effect for social interaction, ($F (1, 140) = 29.79$, $p < .0001$) – working in a social interaction group made predictions more accurate ($M_{\text{social interaction}} = 4.08$) than the no social interaction group ($M_{\text{no social interaction}} = 8.67$). Importantly, this effect emerged for both discussed topics (M_{social}

interaction = 4.26, SD=1.1 vs. $M_{\text{no social interaction}}$ = 8.08, SD=1.2; t (140) = 3.04, p < .04) as well as non-discussed topics ($M_{\text{social interaction}}$ = 3.94, SD=1.3 vs. $M_{\text{no social interaction}}$ = 9.51, SD=1.4; t (140) = 3.87, p < .01) (figure 4.2).
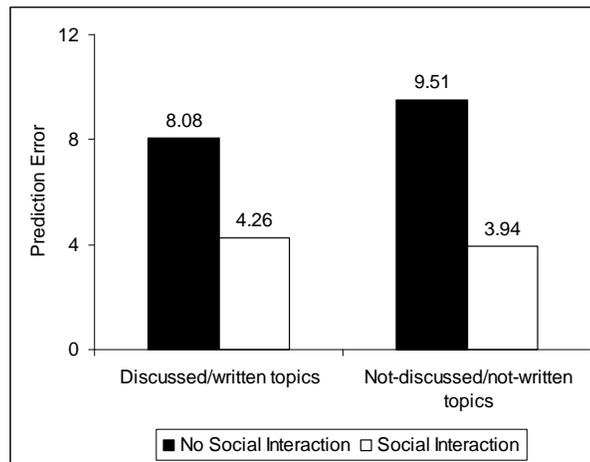
Figure 4.2: Influence of Social Interactions on Prediction Accuracy for Discussed and Non-Discussed Topics (Study 3b)

Attitudinal Contagion. Multilevel analyses yielded a main effect for the social interaction (F (1, 140) = 11.6, p < .001). The social interaction group, where participants had worked as a group and interacted with group members, had smaller deviances ($M_{\text{social interaction}}$ = 1.83, SD=1.08) than the no social interaction group ($M_{\text{no social interaction}}$ = 2.89, SD=1.1). Notably, this was not moderated by whether the topic had been discussed or not – social interaction influence emerged for the discussed topics as well as the non-discussed topics. For discussed topics, social interaction group participants showed marginally smaller individuality score from the group mean than the no social interaction

group ($M_{\text{social interaction}}$ = 2, SD=1.11 vs. $M_{\text{no social interaction}}$ = 2.76, SD=1.13; t (140) = 4.89, p <.004). For non-discussed topics also, the social interaction group showed smaller deviance compared to the no social interaction group ($M_{\text{social interaction}}$ = 1.79, SD=1.09 vs. $M_{\text{no social interaction}}$ = 3.09, SD=1.07; t (140) = 5.76, p < .0001) (figure 4.3).
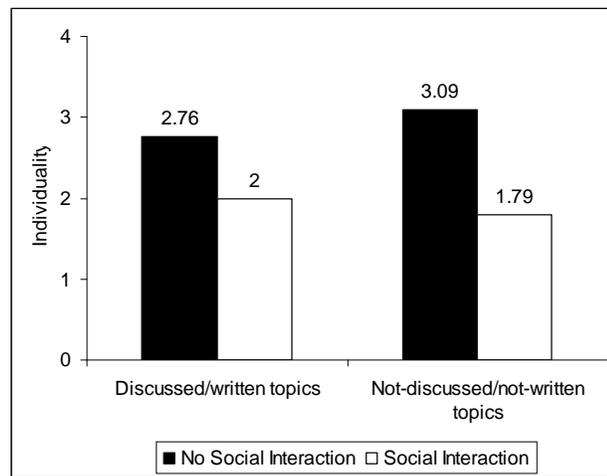

Figure 4.3: Influence of Social Interactions on Attitudinal Contagion (Study 3b)

Mediation Analysis. To investigate whether social clairvoyance mediated the relationship between level of social interactions (i.e., groups) and the attitudinal contagion, we conducted a mediation analysis (figure 4.4), following the Baron and Kenny (1986) procedure. The effect of social interactions on attitudinal contagion (β = .31; $t(142)$ = 2.13, p < .01), the effect of social interactions on social clairvoyance (β = .16; $t(142)$ = 3.52, p < .001), and the effect of social clairvoyance on attitudinal contagion (β = 1.01; $t(142)$ = 8.5, p < .0001) were significant. However, when both social

interaction and social clairvoyance were included in the model as predictors of the

attitudinal contagion, the effect of social clairvoyance was significant ($\beta = .86$; $t(141) =$

4.12, $p < .001$), but the effect of social interaction became non-significant ($\beta = .02$; $p >$

.3). A Sobel test further confirmed that social clairvoyance mediated the effect of social

interaction on attitudinal contagion ($z = 3.53$, $p < .001$).
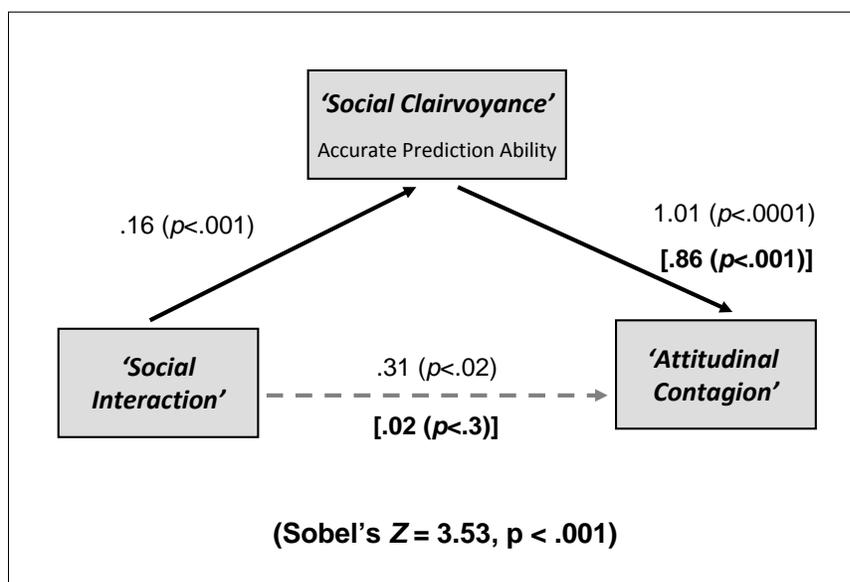
Figure 4.4: Social Clairvoyance Mediated the Effect of Social Interaction on
Attitudinal Contagion (Study 3b)

Recall that we mentioned earlier if individual's own attitude is indeed used to

predict the attitudes of similar others, then this would suggest the mediating role of

attitudinal contagion on the effect of social interaction on social clairvoyance—that is,

social interaction --> attitudinal contagion --> social clairvoyance. When we tested the

alternate account, whether attitudinal contagion mediated the relationship between level of social interactions (i.e., groups) and social clairvoyance, the effect of social interactions on social clairvoyance ($\beta = .16$; $t(142) = 3.52$, $p < .001$), the effects of social interaction on attitudinal contagion ($\beta = .31$; $t(142) = 2.11$, $p < .01$), the effect of attitudinal contagion on social clairvoyance ($\beta = .72$; $t(142) = 1.92$, $p < .05$) were significant. However, when both social interaction and attitudinal contagion were included in the model as predictors of the social clairvoyance, the effect of social interaction was significant ($\beta = .24$; $t(142) = 1.99$, $p < .05$), but the effect of attitudinal contagion became non-significant ($\beta = .82$; $p > .2$). This suggests that, social projection was not used as a strategy to predict others attitude.

Discussion

The results of social clairvoyance and attitudinal contagion were identical to previous studies, suggesting the robustness of the findings. Additionally, in two different ways we ruled out the projection account as a strategy to infer others' attitudes. More importantly, we demonstrate that social clairvoyance mediated the relationship between social interactions and attitudinal contagion. Together, this results suggest that the ability to infer other's likes and dislikes during social interaction help one to intuit another person's thoughts, feelings, and inner mental states and such insight is automatically used in constructing one's own attitude.

Study 3c: "Malleable Attitudes Moderates Attitudinal Contagion"

What could be the possible moderators of attitudinal contagion effects? We suggest attitude strength as a potential moderator. A key advance in the attitudes literature over the past two decades has been the notion of attitude strength. Attitudes of

similar extremity (e.g., a +4 on a scale ranging from -4 to +4) can differ as to their

underlying strength. Attitudes which are the result of thoughtful elaboration are based

upon the cognitive responses associated with the attitude and are stronger than attitudes

that are based upon less thoughtful processes such as heuristics and peripheral cues. Why

does strength matter? A bevy of research has revealed that attitude strength moderates the

influence of attitudes: Strongly held attitudes are more consequential than weakly held

attitudes. Taking this into consideration, it seems probable that someone with a weakly

held attitude for certain attitude object are more likely to be biased by other's attitudes in

his/her social group than another person with the strongly held attitude for the same

attitude object. However, in study 3a attitudinal contagion was not moderated by the

strength of the topics. Why? One possible reason could be related to our stimuli selection.

It is possible that the strength of the topics (i.e., high-involvement vs. low-involvement

topics) was not manipulated with sufficient difference. For example, in study 1a (figure

2.2) participants in social interaction condition were equally good at predicting attitudes

towards high-involvement as well as low-involvement topics ($M_{\text{high-involvement topic}}$ = 4.1,

SD=1.2 vs. $M_{\text{low-involvement topic}}$ = 3.5, SD=1.3; ns), however, participants in no-social

interaction condition were worse at predicting attitudes towards low-involvement targets

rather than high-involvement targets ($M_{\text{high-involvement topic}}$ = 6.6, SD=1.1 vs. $M_{\text{low-involvement}}$

$_{\text{topic}}$ = 8.1, SD=1.2; t (126) = 2.72, p < .01.

We selected a different set of stimuli for this study and compared the relative

strengths of topics used in both studies 3a and 3c through a pretest. Our examination of

both sets of topics revealed that strength manipulation was successful for both study 3a

($M_{\text{high-involvement topic}}$ = 4.41, SD=2.1 vs. $M_{\text{low-involvement topic}}$ = 3.28, SD=2.3; t (162) = 10.76,

$p <.0001$; Cohen's $d = 7.85$) and study 3c ($M_{\text{high-involvement topic}} = 5.72$, SD=1.3 vs. $M_{\text{low-involvement topic}} = 2.53$, SD=1.2; $t(142) = 11.77$, $p <.0001$; Cohen's $d = 8.89$). However, there was difference in the relative strength of the topics. An ANOVA revealed the main effect for the strength of topic, ($F(1, 204) = 222.85$, $p < .0001$) – which was tempered by a study (study 3a vs. 3c) x strength interaction, ($F(1, 204) = 51.62$, $p < .0001$). The interaction is graphed in figure 4.5 and was mainly due to the difference in attitudes towards low-involvement and high-involvement targets for both studies. Comparing to study 3a topics, the high-involvement topics in study 3c are stronger in terms of attitude strength measure and the low-involvement topics in study 3c are more malleable in terms of attitude strength measure.
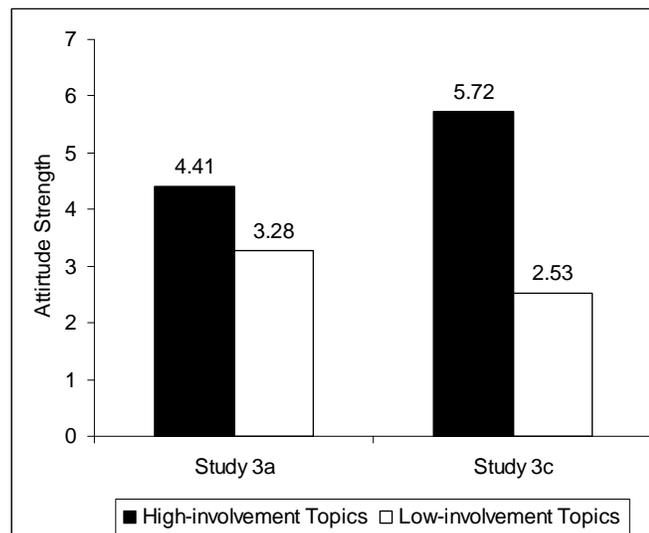

Figure 4.5: Relative Strengths of Topics Used in Studies 3a and 3c (Pretest)

Given the strength manipulation with sufficient difference in study 3c, we expect to see moderation effect of strength on attitudinal contagion. In other words, we expect that individuals with weakly held attitude for certain target attitude object are more likely to shift their attitudes towards the group attitudes comparing to individuals with strongly held attitude. However, engaging in social interaction will make possible for individuals to predict others' attitudes more accurately regardless of whether the target objects were strongly or weakly help by other members of the group. Thus, we do not expect to see moderation effect of strength on social clairvoyance.

Participants, Design and Procedures

One hundred and ninety three undergraduate students participated in the study and were randomly assigned an identification number that was the basis for forming groups. Participants worked in groups of two and were randomly assigned in a social interaction group or no social interaction group. The procedure of this study was same as study 3b except that we used a different set of stimuli for this study (appendix C). The dependent variables of interest were (1) a measure of prediction error score (calculated same as study 1a), and (2) a measure of individuality score (calculated same as study 3a).

Results

We first tested if there were any differences in self-reported and predicted attitudes between the two conditions—social interaction and no-social interaction conditions. No difference were observed between self-reported attitudes ($M_{\text{social interaction}} =$ 1.92, SD=1.62 vs. $M_{\text{no social interaction}} = 1.52$, SD=1.23; *NS*) as well as predicted attitudes ($M_{\text{social interaction}} = 1.54$, SD=1.48 vs. $M_{\text{no social interaction}} = 1.59$, SD=1.29; *NS*) across the

social interaction and no-social interaction conditions suggesting that there was no regression to the middle of the attitude scale in these two groups to begin with.

Social Clairvoyance. Analyses yielded a main effect for social interaction, (F (1, 189) = 5.6, $p < .02$) – being engaged in social interaction (comparing to no social inter action condition) made predictions more accurate ($M_{\text{social interaction}} = 4.23$ vs. $M_{\text{no social interaction}} = 6.49$). Importantly, this effect emerged for both discussed topics ($M_{\text{social interaction}} = 4.76$ vs. $M_{\text{no social interaction}} = 6.39$; t (189) = 3.24, $p < .03$) as well as non-discussed topics ($M_{\text{social interaction}} = 3.78$ vs. $M_{\text{no social interaction}} = 6.58$; t (189) = 4.17, $p < .001$) (figure 4.6).
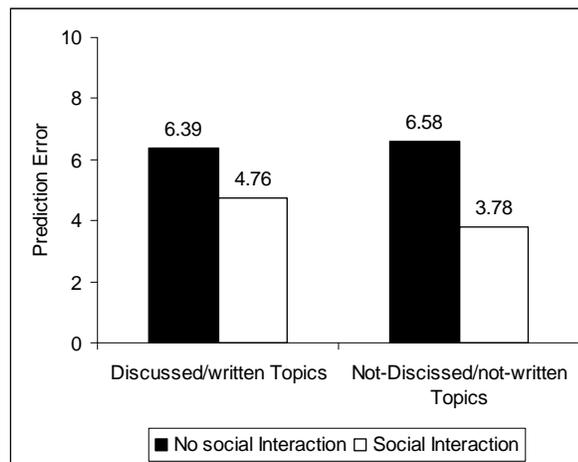

Figure 4.6: Influence of Social Interactions on Prediction Accuracy for Discussed and Non-Discussed Topics (Study 3c)

A main effect also emerged for strength of topics, (F (1, 189) = 3.44, $p < .06$) and emerged for both high-involvement topics ($M_{\text{social interaction}} = 3.28$, SD=2.1 vs. $M_{\text{no social}}$

interaction = 5.77. SD=2.3; t (189) = 2.91, $p < .05$) and low-involvement topics (M_{social}

interaction = 5.23, SD=2.4 vs. $M_{\text{no social interaction}}$ = 7.21, SD=2.3; t (189) = 2.65, $p < .06$)

(figure 4.7). In other words, engaging in social interaction made it possible for

individuals to predict others' attitudes more accurately regardless of whether the other

had shared his/her attitude, and also regardless of strength of the topics (i.e., whether the

topics were relatively important or unimportant).
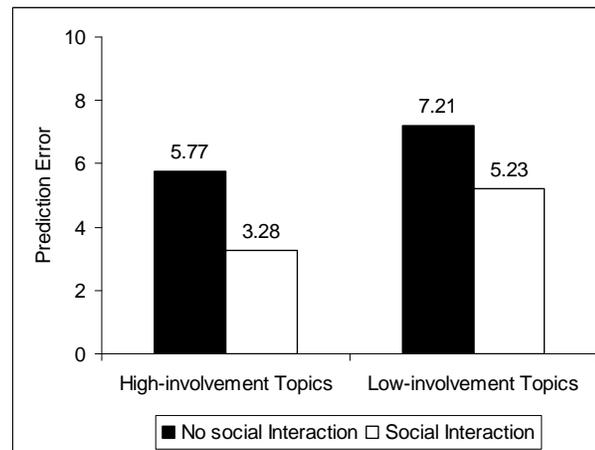
Figure 4.7: Influence of Social Interactions on Prediction Accuracy for High-involvement vs. Low-involvement Topics (Study 3c)

Attitudinal Contagion. Multilevel analyses yielded a main effect for the social

interaction (F (1, 189) = 28.91, $p < .0001$). Participants in social interaction group had

smaller deviances ($M_{\text{social-interaction}}$ = 1.95, SD = 2.1) than the participants in no social

interaction group ($M_{\text{no social-interaction}}$ = 2.65, SD=2.2). Additionally, the three-way

interaction between social interaction, discussion and strength of the topic was significant

(F (1, 189) = 3.41, p < .06) (figure 4.8). Decomposition of this interaction revealed that

attitudinal contagion was moderated by the strength of the topic—that is, attitudinal

contagion emerged for only low-involvement topics and not for the high-involvement

topics. The simplest thing is to observe that there were no differences between the

various high-involvement conditions. For low-involvement topics, attitudinal contagion

emerged for the discussed topics as well as the non-discussed topics. For discussed

topics, participants in the social interaction condition reported marginally smaller

individuality from the group mean than the no social interaction group ($M_{\text{social interaction}}$ =

1.59, SD=2.1 vs. $M_{\text{no social interaction}}$ = 2.45, SD=2.3; t (189) = 1.96, p <.06). Similarly, for

non-discussed topics, participants in the social interaction condition reported smaller

deviance compared to the no social interaction group ($M_{\text{social interaction}}$ = 1.31. SD=2.1 vs.

$M_{\text{no social interaction}}$ =3.08. SD=2; t (189) = 3.16, p < .001) (figure 4.8).
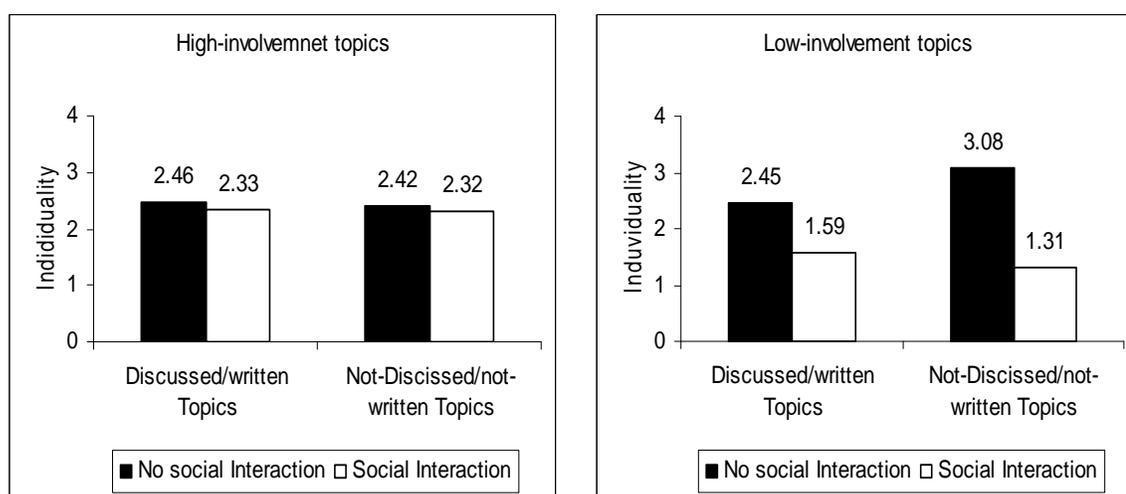
Figure 4.8: Attitude Strength Moderates Attitudinal Contagion (Study 3c)

Discussion

We suggested that attitude strength is a possible moderator of the attitudinal contagion effect but not the social clairvoyance effect. The results of study 3c confirm our prediction of attitude strength being a moderator of attitudinal contagion effect. The findings of study 3c clearly show that individuals with a weakly held (strongly held) attitude for certain attitude object are more (less) likely to be biased by other's attitudes in their social group. Additionally results demonstrate that the social clairvoyance emerged for both weakly and strongly held attitudes—being engaged in social interactions rendered predictions equally accurate for high-involvement targets as well as low-involvement targets. Note that, "social clairvoyance" emerges for strongly held and weakly held attitudes (i.e., both high-involvement and low-involvement topics), however, "contagion" occurs only for weakly held attitudes (i.e., only low-involvement topics) suggesting that individuals correct for the bias when attitude is held strongly.

CHAPTER 5

CONCLUSION

Discussion of Findings

We must all hang together, or assuredly we shall all hang separately.   ---

Ben Franklin

We report a phenomenon wherein being part of a group results in a 'herd mentality' with regards to the attitudes and preferences held by the individuals who make up the group. Specifically, being exposed to the attitudes of other group members influences one's own attitudes, not only to the attitude objects that were discussed but also for other attitude objects where one was not explicitly exposed to attitudes held by other members of the group. We have argued that this is because of an unconscious ability to make shrewd guesses about others' attitudes based on a little information. That is, as Ben Franklin suggests, we appear to have a social need to "hang in together" and one way this is expressed is by making shrewd guesses about, and mirroring, others' likes and dislikes.

In our first three studies (1a, 1b and 1c) we demonstrate the phenomena of *social clairvoyance*. In study 1a, we demonstrated that strangers placed in a social situation are very accurate at judging the likes and dislikes of others in their group, even when never explicitly exposed to others' attitudes toward specific targets. In study 1b we ruled out an alternative explanation—that is inter-item correlation used as a strategy— of the social clairvoyance effects. Taken together the first two studies provide initial evidence for social clairvoyance. Study 1c provides some clues for plausible mental mechanisms, namely empathic processing. Social interaction, however, appears to increase the fidelity

of these inferences markedly. This is, because social interaction provides other information such as body language, facial expression etc that allows one to empathically simulate others' minds in one's own mind. In other words, it permits a temporary and mental occupation of another's skin. In study 2a and 2b we adopt an individual difference approach (in study 2a we measured empathy and in study 2b we manipulated empathetic processing) to test proposed empathic process for social clairvoyance. We find that empathy moderates this phenomenon –individuals who are particularly good at empathic responding appear to be particularly able to display social clairvoyance. In last three studies (studies 3a, 3b, and 3c) we have shown the key phenomenon of attitudinal contagion.

Study 3a demonstrates the convergence in the attitudes of group members as a result of working in a group and being engaged in social interaction compared to not working in a group and not being engaged in social interaction. Importantly, this convergence in attitudes happens for discussed, as well as non-discussed attitude objects. In study 3b, provide further support for our proposed process by demonstrating social clairvoyance as a mediator of the relationship between social interaction and attitudinal contagion. Additionally, we have replicated both social clairvoyance and attitudinal contagion observed in earlier studies. Finally in study 3c, we show the moderating role of attitude strength on attitudinal contagion but not on social clairvoyance. Together, the studies support our central thesis of group influence on consumer attitudes.

Theoretical Implication

Our research makes an important theoretical contribution. To the best of our knowledge, no previous study has attempted to explore the attitudinal contagion effects

for non exposed target objects. While the idea of group influence is certainly not new, these findings suggest it to be a much more pervasive and insidious process than was thought previously. Not only do people take on others' explicitly stated attitudes (which can be explained using ideas related to informational influence or normative influence), they also take on others' unstated attitudes. We have also identified social clairvoyance as an underlying mechanism of attitudinal contagion. That is, attitudinal contagion can happen because people can accurately predict the likes and dislikes of other members of the group by simulating other person's emotional state. Since one is able to put one's own emotional responses on hold while simulating other's emotions/reactions as their own, their own personal emotions or reactions would be biased by that. Specifically, these accurate guesses about others' likes and dislikes bias one's own attitudes (attitudinal contagion). Furthermore we show that this happens only for the attitudes that are malleable in nature (i.e., weakly held attitudes); for strongly held attitudes individuals still predict others' attitudes that appear to correct for biasing nature of that prediction. Additionally, we identified social clairvoyance as a mediator of the effect of attitudinal contagion.

<div align="center">Practical Implication</div>

The current findings also have several implications of practical interest. Much of consumer behavior is a socially interactive experience. Accordingly, many consumption decisions and experiences involve the influence of more than one person. Understanding social clairvoyance and attitudinal contagion would obviously be of benefit to marketers in predicting a variety of marketing phenomena from diffusion of innovations to word-of-mouth. For example, the extant literatures suggest marketing phenomena namely

diffusion of innovations to word-of-mouth happen under a condition when individuals are directly exposed to others opinion or judgments. However, our findings suggest that these phenomena could happen without direct exposure to others' attitudes/judgments. Being exposed to other's attitudes towards some attitude objects are enough to predict other's attitudes towards a variety of attitude objects and which further bias one's own attitudes. It also suggests that it would behoove marketers to obtain a much better understanding of the social environment of their consumers. Techniques such as network analysis seem to be called for, not just to understand phenomena such as word of mouth, but much more basic individual level phenomena in decision-making.

In recent years, it seems that many marketers see the social media frontier as the next marketing gold rush. Given the low cost of entry, many marketing pros are doing more than just dipping their creative toes into this gold-laden water. However, many marketers still don't know how to get their arms around it and want to know the best strategies to use for social media marketing. Our finding suggests that creating a topical conversation about the brand is helpful. For instance, engaging the audience in a conversation about the product (instead of pushing consumers to buy), might generate interest among the group members and thus they might be more empathetic towards the attitude of other members in their social group. Based on our findings, it seems also plausible that generating the empathetic responding towards others probably would lead to contagion in opinion/attitudes towards various products. Thus, creating interest and honest discussion in social media about what they need and how the brand fulfills that need would probably be a useful tactics. Instead of pushing (incenting customers to buy),

try pulling (create a dialogue so they seek out the product). Pull is an effective means of audience-centered, participatory marketing.

Limitations

Several issues were not addressed in our paper. First, in all studies, participants worked in small groups of two or three members. Extant literature suggests that group size affects group members' attitudes and choice behavior (Brewer and Kramer 1986). Second, in our studies participants were not familiar with each other and in most cases they interacted briefly with other group members (except study 1b and 1c). Third, all our participants are undergrad marketing students from the same university. Fourth, we did not investigate gender difference in both social clairvoyance and attitudinal contagion. Fifth, we have suggested social clairvoyance likely to be an automatic process, without providing a direct measure of automaticity.

Future Directions

An important direction for future research would be to investigate the source of prediction error—whether it is a function of main effects as well as correlation or just one of these two types of errors (Yates 1982). Future research should explore how various group sizes affect social clairvoyance and attitudinal contagion effects. How factors such as familiarity with other group members, repetition of interactions influence social clairvoyance and attitudinal contagion effects? Additional testing is needed to provide some evidence in support of the idea whether social clairvoyance is "unconscious" or "conscious" process. Further testing could be done regarding the prediction accuracy and its effects on one's attitude for various age groups and culture. For instance, do the results of the studies which have been done to date apply equally as people age, or is

there a decline in prediction accuracy and thus in attitudinal contagion as people age? Do our findings would hold in another culture such as independent versus interdependent?

Cultures can be characterized as independent versus interdependent (Markus and Kitayama 1991), and research has shown that people reared in cultures with highly individualistic values tend to develop a view of self as an independent agent, while those reared in cultures with highly collectivist values develop a view of self as interdependent with others. Cultural differences in independence-interdependence manifest in domains such as creativity, communication, and even basic cognitive processing (Nisbett, Peng, Choi and Norenzayan, 2001). Future research should also see whether interdependent culture show greater clairvoyance and contagion. Answering the questions posed above and others will advance the understanding of how people are influenced by others even when they are not explicitly exposed to other's behavior/judgments. Is there any gender difference in social clairvoyance and attitudinal contagion? For example, are females more socially clairvoyant than men and hence more susceptible to attitudinal contagion? Future research could address that by examining the moderating role of gender.

APPENDIX A

STIMULI USED IN STUDIES 1A, 1B, 1C, 2A, 2B

1. Discuss (write) the advantages and disadvantages of Apple iPod and whether it provides good value to its consumers.
2. Discuss (write) the advantages and disadvantages of Dell Notebook and whether it provides good value to its consumers.
3. Discuss (write) the advantages and disadvantages of Columbia Jackets and whether it provide good value to its consumers.
4. Discuss (write) the advantages and disadvantages of Panasonic microwave and whether it provides good value to its consumers.
5. Discuss (write) the advantages and disadvantages of Dasani bottled water and whether it provides good value to its consumers.
6. Discuss (write) the advantages and disadvantages of Honeywell digital thermostat and whether it provides good value to its consumers.
7. Discuss (write) the advantages and disadvantages of children's clothing industry and whether the industry provides good products for children.
8. Discuss (write) the advantages and disadvantages of beverage industry and whether the industry provides good products for beverage drinkers.
9. Discuss (write) the advantages and disadvantages of GE bulbs and whether it provides good value to its consumers.
10. Discuss (write) the advantages and disadvantages of Toro snow blower and whether it provides good value to its consumers.
11. Discuss (write) the advantages and disadvantages of the computer industry and whether the industry provides good value to its consumers.
12. Discuss (write) the advantages and disadvantages of Kenmore Water Heaters for the home and whether it provides good value to its consumers.
13. Discuss (write) the advantages and disadvantages of Huggies diaper and whether it provides good value to its consumers.
14. Discuss (write) the advantages and disadvantages of Centrum vitamins and whether it provides good value to its consumers.
15. Discuss (write) the advantages and disadvantages of Oster Rice Cooker and whether it provides good value to its consumers.
16. Discuss (write) the advantages and disadvantages of the automobile industry and whether the industry provides good value to its consumers.
17. Discuss (write) the advantages and disadvantages of Black & Decker Lawn mower and whether it provides good value to its consumers.
18. Discuss (write) the advantages and disadvantages of iPod and whether it provides good value to its consumers.
19. Discuss (write) the advantages and disadvantages of Nikon digital SLR cameras and whether it provides good value to its consumers.
20. Discuss (write) the advantages and disadvantages of Haier compact refrigerators and whether it provides good value to its consumers.
21. Discuss (write) the advantages and disadvantages of Serta mattress and whether it provides good value to its consumers.

22. Discuss (write) the advantages and disadvantages of the cell phone industry and whether the industry provides good value to its consumers.
23. Discuss (write) the advantages and disadvantages of Ethan Allen furniture and whether it provides good value to its consumers.
24. Discuss (write) the advantages and disadvantages of Bridgestone Golf Balls and whether it provides good value to its consumers.

APPENDIX B

STIMULI USED IN STUDIES 3A, 3B

1. Discuss (write) the advantages and disadvantages of Dell Notebook and whether it provides good value to its consumers.
2. Discuss (write) the advantages and disadvantages of Columbia Jackets and whether it provide good value to its consumers.
3. Discuss (write) the advantages and disadvantages of Panasonic microwave and whether it provides good value to its consumers.
4. Discuss (write) the advantages and disadvantages of Dasani bottled water and whether it provides good value to its consumers.
5. Discuss (write) the advantages and disadvantages of beverage industry and whether the industry provides good products for beverage drinkers.
6. Discuss (write) the advantages and disadvantages of GE bulbs and whether it provides good value to its consumers.
7. Discuss (write) the advantages and disadvantages of Toro snow blower and whether it provides good value to its consumers.
8. Discuss (write) the advantages and disadvantages of Huggies diaper and whether it provides good value to its consumers.
9. Discuss (write) the advantages and disadvantages of Centrum vitamins and whether it provides good value to its consumers.
10. Discuss (write) the advantages and disadvantages of Oster Rice Cooker and whether it provides good value to its consumers.
11. Discuss (write) the advantages and disadvantages of the automobile industry and whether the industry provides good value to its consumers.
12. Discuss (write) the advantages and disadvantages of Black & Decker Lawn mower and whether it provides good value to its consumers.
13. Discuss (write) the advantages and disadvantages of iPod and whether it provides good value to its consumers.
14. Discuss (write) the advantages and disadvantages of Nikon digital SLR cameras and whether it provides good value to its consumers.
15. Discuss (write) the advantages and disadvantages of Haier compact refrigerators and whether it provides good value to its consumers.
16. Discuss (write) the advantages and disadvantages of Serta mattress and whether it provides good value to its consumers.
17. Discuss (write) the advantages and disadvantages of Ethan Allen furniture and whether it provides good value to its consumers.
18. Discuss (write) the advantages and disadvantages of Bridgestone Golf Balls and whether it provides good value to its consumers.

APPENDIX C

STIMULI USED IN STUDY 3C

High-involvement Topics

1. The University of Iowa is considering increasing tuition for both undergraduate and graduate students beginning in fall 2011. Please indicate how you feel about an increase in tuition in the University of Iowa.
2. The state of Iowa is debating about lowering the drinking age from 21 to 18. Discuss the advantages and disadvantages of lowering the drinking age from 21 to 18.
3. The university is considering increasing the credit requirements for graduation beginning in December 2011. This would entail your having to take some extra courses. Please indicate how you feel about an increase in credit requirements.
4. The City of Iowa City is contemplating an increase in housing taxes effective immediately – this increase is to provide civic amenities and services. If this becomes effective, it will mean that your rent will go up by about 10% even if you are living in the Residence Halls. Please indicate how you feel about an increase in housing taxes in Iowa City.
5. The university is considering the introduction of senior comprehensive examinations beginning in Fall 2011. This would entail students having to take these comprehensive examinations before being allowed to graduate. Please indicate how you feel about senior comprehensive exams.
6. The University if Iowa has announced that it will allow opposite-sex students to share rooms in all Residence Halls under a pilot program in the fall 2008. Please indicate how you feel about this new policy.
7. The University of Iowa is debating about changing visiting hours in the Residence Halls. Under this new policy students will be required to register guests and those guests will be out of the dorm rooms by 11 p.m. on weeknights (and 1:00 a.m. on the weekends). Please indicate how you feel about this new dorm policy.
8. The University of Iowa Sport's Department is planning to increase football ticket price from coming season. Please indicate how you feel about increasing football ticket price.

Low-involvement Topics

1. Discuss the advantages and disadvantages of building a parking garage in the downtown Iowa City.
2. Please indicate how you feel about starting a new casino in the downtown Coralville to attract more businesses in the city.
3. Please indicate how you feel about using tax payers' money for homeless people in Iowa City.
4. Please indicate how you feel about introducing school uniforms in all North Liberty school districts.
5. Please indicate how you feel about banning power boats on Coralville Lake.

6. Please indicate how you feel about increasing teacher's pay in Cedar Rapids.
7. Please indicate how you feel about increasing working hours at Iowa Public Library.
8. The university is debating about an increase in monthly parking fees for the staff and professors. Please indicate how you feel about increasing the monthly parking fees for staff and professors.

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